APPROVED

By the Chairman of the Board, Rector of the JSC «International Information Technology University»

_____ A.K. Khikmetov

«30» 03 2023

EDUCATIONAL PROGRAM

6B06111 "Financial Mathematics"

Code and classification of the field of education: 6B06 – Information and communication technologies

Code and classification of study areas: 6B061 - Information and communication technologies

Group of educational programs: 057 – Information technologies

Level according to ISCE: 6

Level according to NQF: 6

Level according to IQF: 6

Duration of study: 4 years

Credits: 240

Almaty, 2023

Content

List of designations and abbreviations

CD	Cycle of core disciplines
CC	Core competency
BM	Basic module
UC	University component
HE	Higher education
NMS	National Mandatory Standards of Higher and Post-Graduate Education
ATT	Additional types of training
EQF	European qualifications framework
EFE	European foundation for education
KSA	Knowledge, Skills and Abilities
FA	Final attestation
OC	Optional component
ISCED	International Standard Classification of Education
NQF	National qualifications framework
NQS	National qualifications system
GHM	General humanitarian module
RC	Required component
GEM	General education module
GED	Cycle of general education disciplines
AP	Academic program
GPM	General professional module
SQF	Sectoral qualifications framework
GEC	General education competence
M	Cycle of majors
PI	Professional internship
PS	Professional standard
PE	Postgraduate education
PC	Professional competence
PM	Professional module
LO	Learning outcome
QMS	Quality Management System

1. Description of the educational program

For practical use of financial science, mathematical models are required, the use of which will allow not only to deal with the state of the economy, but also to say with sufficient precision what will happen with finances over time, what are the consequences, what is the socio-economic price of the decisions made. But today, managers are forced to make decisions, guided by experience and intuition, without resorting to a computer. The computer allows you to make available information, for which it used to take a long time, but the computer does not allow to form and evaluate the decisions made. Financial and mathematical modeling is intended to correct this situation. And the first task that naturally arises in the process of mathematical modeling is an adequate formulation of the problem. In the framework of any activity a person is forced to make decisions that are not always infallible. The cost of the error depends on the scale of the decisions made. The consequences of mistakes when making decisions in the economic sphere are so great that in order to avoid them, economic-mathematical modeling is used. Economic-mathematical modeling is a tool for the manager and has the goal of making informed decisions and assessing their consequences. Financial forecasting, like planning, is a type of management activity. The purpose of forecasting is to ascertain ideas about the future in accordance with the proposed activity of the company as a whole or to assess the consequences of the decisions made. The financial forecast relies on information about the state of the object and the external environment and their intended change, taking into account the emergence of new factors and patterns, as well as the associated consequences. Modeling is, first of all, a way to solve problems that arise in difficult cases and accompany all the activities of a manager at any level.

Our approach involves both covering the basic skills of the specialty MCM, and through the possibilities of the subjects of choice to cover the necessary elements of training in the area of "Financial Mathematics".

At the same time, the student is left with the possibility of taking, at his discretion, additional subjects as free electives - these may be subjects from any specialty.

Meetings conducted by the IITU marketing service and analysis of surveys conducted among graduates of the NIS, physical and mathematical schools showed that about 10 percent of graduates seriously think about the professions related to computer modeling of complex economic problems.

2. Purpose and objectives of the educational program

The purpose of the educational program "Financial Mathematics" is to prepare bachelors who are familiar with the modern methodology of statistical evaluation and analysis of the market economy; the formation of future specialists of solid theoretical knowledge and practical skills of financial and economic calculations, allowing to effectively carry out investment activities and manage finances. The main goal of the science of finance is to study how limited resources are distributed over time. The emphasis is on the time distribution, and not on other types of distribution studied in the economy, which is a distinctive feature of financial science.

The objectives of the educational program "Financial Mathematics" are:
- Mastering the fundamentals of the mathematical apparatus of modern methods of quantitative financial analysis, necessary for a wide range of diverse financial and economic calculations
- Learn to make decisions about the temporary allocation of resources, constitute financial decisions.

- Teach to make financial decisions; allocable resources are related either to income (receipts) or to expenses (expenses).
- Make financial decisions based on a balance between cost and income streams.

3. Requirements for the results of the development of the educational program

By the end of the Financial Mathematics educational program, students will be able to:

- Develop optimization methods and control algorithms.
- To argue the choice of basic standards, principles and design patterns, methods, tools and programming languages, including choosing methods and tools for building information security systems of modern ICT.
- Build a 3D visualization.
- Extract the necessary information from various sources, including information flows in real time.
- Apply mathematical models and methods of various processes.
- To find ways to solve problems that arise in difficult cases and accompany all the activities of a manager at any level, i.e. economic modeling.
- Create mathematical models using the methods of modern information technologies.
- Develop and / or use software, hardware, information, mathematical, and functional support of information systems, including algorithms and information security methods.
- To demonstrate sociability, initiative and psychological preparedness for work, including when working in a team and making management and technical decisions.
- Be able to develop programs in R, Java, C++.
- Conduct economic forecasting.

The following examination forms are used as an assessment of learning outcomes: computer testing, written exam (answers on the sheets), an oral exam, project (passing a course project), practical (open questions on a computer, solving problems on a computer, including in ACM format) comprehensive (test / written / oral + others). In accordance with table 1, the following ratio of exam forms is recommended:

Table 1

№	Examination form	Recommended share,%
1	Computer testing	20%
2	Written exam	10%
3	Oral exam	5%
4	Project	30%
5	Practical	30%
6	Complex	5%

Final certification ends with the defense of the graduation project.

4. Passport of the educational program

4.1 General information

№	Field name	Note
1	Code and classification of the field of education	6B06 - Information and communication technology
2	Code and classification of training areas	061 - Informationandcommunicationtechnology
3	Groupofeducationalprograms	057 - InformationTechnology
4	Name of the educational program	"FinancialMathematics"
5	Brief description of the educational program	The main competences of the educational program "Financial Mathematics": making informed decisions and assessing their consequences; clarification of ideas about the future in accordance with the intended activity of the company as a whole or assessment of the consequences of decisions made, i.e. economic forecasting; ways of solving problems arising in difficult cases and accompanying all activities of a manager of any level, i.e. economic modeling. OP structure: • adequate formulation of the problem; • development of optimization methods and control algorithms; • creation of mathematical-economic models of economic processes; • research activities in areas using the methods of mathematics and system programming; • application of modern mathematical methods and software for solving problems; developing programs in R, Java, C ++.
6	Goal of EP	Preparation of bachelors, who own modern methodology of statistical evaluation and analysis of market economy; the formation of future specialists of solid theoretical knowledge and practical skills of financial and economic calculations, allowing to effectively carry out investment activities and manage finances. The main goal of the science of finance is to study how limited resources are distributed over time. The emphasis is on the time distribution, and not on other types of distribution studied in the economy, which is a distinctive feature of financial science.
7	ISCE level	6
8	NQF level	6
9	IQF level	6

10	Thelistofcompetenciesoftheeducationalprogram:

GC1: Know: socialandethicalvaluesbasedonpublicopinion, traditions, customs, socialnormsandfocusonthemintheirprofessionalactivities; traditionsandcultureofthepeoplesofKazakhstan; humanandcivilrightsandfreedoms; fundamentalsofthelegalsystemandlegislationofKazakhstan; socialtrendsofsociety; basicsofphysicalcultureandprinciplesof a healthylifestyle.

GC2: Have an idea about ethical and spiritual values; about sociological approaches to the individual, the basic laws and forms of regulation of social behavior; the nature of power and political life, political relations and processes, the role of political systems in the life of society and various social groups; about the role of consciousness and self-awareness in the behavior, communication and activities of people, the formation and formation of personality.

GC3: Possess: ethical and legal norms of behavior; a system of practical knowledge and skills ensuring the acquisition, development, improvement and activation of psychophysical abilities and qualities, the acquisition, preservation and strengthening of health, the ability to work in a team, correctly defend their point of view, propose new solutions.

GC4: Ability to write and oral communication in the state language and the language of international communication; ability to logically correct, reasoned and clearly build oral and written speech; readiness to use one of the foreign languages

GC5: Ability to use modern information technologies, manage information using business application programs; use network computer technologies, databases and application packages in their subject area

GC6: Ability to model financial and economic processes to solve specific problems.

GC7: The ability to predict financial and economic data using modern information technologies, computer technologies, databases and application packages in their subject area

BC1: The ability of real use of the state language, the language of international communication and a foreign language in professional activities.

BC2: Ability to understand the basics of economic knowledge, scientific ideas about finance, economics.

BC3: Ability to professional use of modern equipment, devices, network components, computer systems (in accordance with the objectives of the program), as well as use the rules of safety, industrial hygiene, fire safety and labor protection standards.

BC4: Ability to possess skills of using algorithms and programs for calculating parameters of business processes.

BC5: The ability to use the basic provisions and methods for solving problems, the ability to carry out project documentation in the software environment of computer graphics for various types of projects.

BC6: The ability to be competent in the choice of mathematical modeling methods for solving specific financial problems, including the willingness to identify the natural scientific essence of problems arising in the course of professional activity, and the ability to involve the appropriate physical and mathematical apparatus for its solution.

BC7: The ability to develop information and software information systems based on modern methods and development tools.

BC8: Ability to find limits, uncover uncertainties; differentiate and integrate basic elementary functions; investigate functions using differential calculus; apply the methods of differential and integral calculus in solving applied problems. be able to classify differential equations and apply the necessary methods to solve these equations; solve linear differential equations of order n and systems of linear equations with constant coefficients; find the quiescent points of the autonomous system;

	PC1: The ability to create mathematical models using the methods of modern information technologies; PC2: The ability to conduct economic forecasting; PC3: The ability to find solutions to problems that arise in difficult cases and accompany all the activities of a manager at any level; PC4: Ability to develop optimization methods and control algorithms; PC5: The ability to build problem solving algorithms; PC6: The ability to use application programs to solve the problem; PC7: Ability to build 3D visualization. PC8: The ability to apply the acquired knowledge in the selected additional educational program.	
11	The learning outcomes of the educational program: LO1: Develop optimization methods and control algorithms. LO2: To argue the choice of basic standards, principles and design patterns, methods, tools and programming languages, including choosing methods and tools for building information security systems of modern ICT. LO3: Build a 3D visualization. LO4: Extract the necessary information from various sources, including information flows in real time. LO5: Apply mathematical models and methods of various processes. LO6: To find ways to solve problems that arise in difficult cases and accompany all the activities of a manager at any level, i.e. economic modeling. LO7: Create mathematical models using the methods of modern information technologies. LO8: Develop and / or use software, hardware, information, mathematical, and functional support of information systems, including algorithms and information security methods. LO9: To demonstrate sociability, initiative and psychological preparedness for work, including when working in a team and making management and technical decisions. LO10: Be able to develop programs in R, Java, C++. LO11: Conduct economic forecasting. LO12: Be able to apply the acquired knowledge in the chosen additional educational program. LO13: Demonstrate the ability to conduct interdisciplinary scientific research using basic knowledge from the fields of economics and law, ecology and life safety. The ability to apply entrepreneurial qualities to the tasks of calculating the profitability of scientific projects. The ability to build personal and interpersonal relationships in compliance with an anti-corruption culture.	
12	Form of study	Full time
13	Language of learning	English
14	Credits	240
15	Awarded academic degree	Bachelor in Information and Communication Technologies in the educational program "6B06111 - Financial Mathematics"
16	Developer (s) and authors:	JSC "International University of Information Technologies", Department of Mathematical and Computer Modeling: - Ydydrys A.Zh. - Maulenov A.O. - Marat G.S.

4.2 The matrix of correlation of the learning outcomes of educational programs with the forming competences

	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10	LO11	LO12	LO13
BK1		V				V			V				
BK2			V	V	V						V		V
BK3		V						V		V			
BK4	V			V	V		V				V		
BK5				V		V	V	V					
BK6			V	V			V				V		
BK7		V	V			V				V			
BK8	V				V						V		
PC1	V	V	V				V			V			
PC2						V					V		
PC3	V					V		V					
PC4	V	V								V			
PC5				V	V		V	V		V			
PC6		V	V							V			
PC7		V	V				V			V			
PC8												V	V

4.3. Information about the disciplines

№	Nameofmodule / discipline	Brief course description (30-50 words)	Num bero fcred its	Formed compet encies (codes)	Prer equis ites	Post requ isites
	Cycle of general education disciplines **University Component / Optional Component**					
1.	History of Kazakhstan	This course consists of studying the modern history of the country to understand the role and significance of current events in a historical context.	5	GC1, GC2	-	-
2.	Philosophy	This course consists of teaching philosophy to form a conscious attitude towards the environment.	5	GC3	-	-
3.	Foreign Language	This course consists of learning a foreign language to form communication skills in a foreign language.	10	GC4	-	
4.	Kazakh (Russian) language	This course consists of teaching Kazakh / Russian language for the formation of communication skills in the state, Russian languages.	10	GC4		
5.	Information and communication technology	The course provides an overview in various areas of ICT, allowing students to obtain basic knowledge of the use of modern ICT in their scientific and practical work, for self-study and other purposes.	5	GC5, BC3		
6.	Political science	The course provides students with knowledge about the political sphere of society, an idea of the relationship and interaction of politics and	2	GC1, GC3		

No.	Course	Description					
		management.					
7.	Sociology	This course consists of sociology training for understanding society and social development.	2	GC2	-		
8.	Psychology	The course introduces various concepts, basic concepts, patterns of management psychology	2	GC3			
9.	Culturology	The course forms the necessary knowledge of cultural studies, develops an understanding of the originality of the cultures of nations.	2	GC2			
10.	Physical education	The course provides a solution to the main tasks of physical education of students, provides for the delivery of control exercises and standards.	8	GC3			
Cycle of General subjects (CGS) **The university component (UC) and (or) the Component of choice (CC)**							
11.	Elective course #1 (CGS)		5				
	Economic theory	The course provides an overview of the principles and patterns of economic relations.		GC6 BC2			
	Startups and entrepreneurship	The course is designed to help students develop IT competencies, entrepreneurial skills, Teamwork, Business Skills and Softskills.		GC3			
	Fundamentals of law and anti-corruption culture	During the course, students will get acquainted with such concepts as anti-corruption consciousness and anti-corruption culture, acquire knowledge about corruption as a phenomenon of modern reality and its historical roots. The discipline forms the acquisition of skills to work with legislation in the field of anti-corruption, and develops a civic attitude to this phenomenon.		GC1 GC3			
	Fundamentals safety of life activity and ecology	This discipline is a higher school that studies ways of safe human interaction with the environment (industrial, household, urban, natural), the sustainable functioning of business facilities (organizations) in emergency situations, issues of protection from negative factors, prevention and elimination of consequences of natural and man-made emergencies and the use of modern means of destruction.		GC3			
	Research metodology	The course is devoted to the study of activities aimed at developing students' ability to make independent theoretical and practical judgments and conclusions, the ability to objectively evaluate scientific information, freedom of scientific search and the desire to apply scientific knowledge in educational activities, including for the completion of a thesis project (work).		GC3 BC5	-	-	
Cycle of basic disciplines **University component**							
12.	Mathematical analysis 1	The purpose of the course is to acquaint students with important	5	BC8	-		Math emsti

		branches of calculus and its applications in computer science. During the learning process, students should be familiar with and be able to apply mathematical methods and tools to solve various applied problems. Moreover, they will study the fundamental methods of research of infinitely small variables using analysis, which is based on the theory of differential and integral calculations.				cal analysis 2
13.	Mathematical analysis 2	The course explains the basic concepts of a definite integral and its properties; use various mathematical methods to evaluate integrals, apply certain integrals to solve applied problems; develop numerical integration methods; to define the concepts of infinite series, approximations of functions and the concept of convergence; apply infinite series in approximate calculations.	5	BC8	Math emati cal analy sis 1	Diffe renti al equat ions
14.	Algebra and geometry	The course includes: Matrix theory, systems of linear equations, vector theory, analytic geometry, limit and differentiation of functions of one variable.	5	BC6	-	
15.	Object oriented programming	The course includes: Encapsulation, inheritance, polymorphism. Creating classes Create useful client applets and stand-alone applications based on actual requirements students receive from real customers or employers.	5	BC7	Intro ducti onto progr amm ingla ngua ges	Algo rithm sand datas truct ures
16.	Numerical Analysis and Algebra Methods	The course includes: Fundamentals of the theory of errors, Systems of linear algebraic equations, Nonlinear equations and systems of nonlinear equations, Interpolation and best approximations, Differentiation and integration of functions, Ordinary differential equations, Equations of mathematical physics.	5	BC4, BC6	Diffe renti al equat ions	Intro ducti on to actua rial scien ce
	The cycle of basic disciplines **Optional component**					
17.	Statistics	The objectives of the course of study of the discipline are familiarization with the main stages of the statistical study of sets; mastering the complex of modern methods of collecting, processing and summarizing statistical information to study the trends and patterns of socio-economic phenomena and processes; mastering the most important methods and techniques of statistical analysis; the	5	BC8	Prob abilit y Thoe ry	

		study of the main objects of applied statistical studies; application of statistical methods, methods of modeling and forecasting socio-economic processes for making sound management decisions; statistical analysis of the largest economic processes of modern society.				
18.	Professionally-oriented foreign language	The course is devoted to the analysis of professional topics: "Computers and work", "Work in ICT", "Types of computer systems", "Fundamentals of working with a computer", "Operating systems and graphical interface", "Text processing", "Cyberspace: security and crime " etc.	4	BK1		
19.	Foreign language for STEM	The course is designed to help students develop their English skills for their current and future academic studies. Improving grammatical accuracy and developing listening, reading, writing and speaking skills in the IELTS format.	2	GC4, BK1		
20.	Probability theory	The course is devoted to probability, as well as the relationship between mathematics and modeling, operating systems as part of an interdisciplinary training program covering the section of mathematical analysis.	4	BC6, PC2	-	Statistics 1
21.	Discrete Mathematics and mathematical logic	Discrete mathematics is a part of mathematics devoted to the study of discrete objects (here discrete means, consisting of separate or unrelated elements). More generally, discrete mathematics is used whenever objects are counted, when relations between finite (or countable) sets are studied, and when processes involving a finite number of steps are analyzed. The main reason for the growing importance of discrete mathematics is that information is stored and processed by computers in a discrete way.	4	BC4, BC6	-	Introduction to Python
22.	Introduction to Python	The goal of mastering the course is to develop programming skills in the Python language. As a result of mastering the discipline, the student must: know the basic constructs and idioms of the Python programming language and be able to put together in practice an uncomplicated program to perform the stated analytical task. Have the skills of formalization and solving practical problems of programming	5	BC6	-	Pythontoanalyzedata
23.	3D Modeling and Design	The goal of the course is to develop students' theoretical foundations and	3	BC4, BC5,PC	Introducti	-

		methods of computer 3D-modeling used in mechanical engineering, the acquisition of skills for solving problems of designing cars and tractors using application programs for modeling and calculating mechanisms and components that allow solving applied problems both in their professional field and when performing coursework and practical work with subsequent training.		7	onto progr amm ingla ngua ges	
24.	Python for data analysis	The course shows how to apply your programming skills to build predictive models, visualize data, and work with neural networks. The course is practice-oriented and will allow you to immediately start working with data and building models.	5	BC6, PK1, PK5	Progr amm ing in Pyth on	Mac hine Lear ning
25.	Machine learning	The course introduces students to the theoretical foundations and algorithms of machine learning, their possible practical implementations and application in solving real problems. As part of this course, students should get an idea of the problems solved with the help of the theory under consideration, and the principles of constructing some basic classifiers.	5	BC6, PK1, PK2	Pyth on for analy zing	DpV data from QED
26.	Discipline of choice No. 4 from CED	Students are given a choice of elective courses.	6	PK1, PK4, PK5		
27.	Discipline of choice No. 5 from CED	Students are given a choice of elective courses.	6	PK1, PK4, PK5		

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Cycle of majors
University Component / Optional Component

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28.	Internship	The practice includes the study of the organizational structure and the complex of technical means of the information-analytical center (IAC) of the organization. Identification of the main tasks solved by the IAC. Study of the information support of the selected task (complex of tasks or subsystem). Studying the software of the selected task (complex of tasks or subsystem). Study of the software of the selected task (complex of tasks or subsystem). The study of the organizational and legal support of the selected task (a set of tasks or a subsystem). systematization and analysis of factual materials required for writing a term paper, a scientific report and a report on practical training.	3	BC5, PC1	-	-
29.	Internship	Practice includes the study of the organizational structure and complex	4	BC5, PC1	-	-

		of technical means of the information-analytical center (IAC) of the organization. Identification of the main tasks solved by the IAC. Studying the information support of the selected task (a set of tasks or a subsystem). Studying the mathematical support of a selected task (a set of tasks or a subsystem). Studying the software of the selected task (a set of tasks or a subsystem). Studying the organizational and legal support of the selected task (a set of tasks or a subsystem). systematization and analysis of the actual materials necessary for writing a term paper, a scientific report and a practice report.				
30.	Undergraduate practice	The practice includes the consolidation of theoretical knowledge of the disciplines of the specialty; mastering practical skills, technology work in the specialty directly in the workplace using a PC, modern software and modern office equipment; the study and analysis of the real situation in the statics and dynamics of CAD in the short and long term with respect to the company - the base of internship; evaluation of the achieved commercial results of automation implementation in the short and long term, in relation to these specific enterprises; familiarity with the technology and technology of CAD development, procedures for making and implementing automation solutions at specific enterprises; collecting material for the graduation projects.	5	BC5, PC1	-	-
	The cycle of majors **Optional component**					
31.	Introduction to Finance	The course will allow students to master the conceptual apparatus in their specialty and prepare for the study of its applied disciplines aimed at the development of professional competencies.	5	PC5, PC6	-	DpV from CED
32.	Derivative financial instruments	The study of the discipline aims to develop students' theoretical knowledge and practical skills in the use of derivative securities. The objectives of the discipline are: - familiarization with types of derivative financial instruments; - the study of the principles of the organization of trade in the market of futures and option contracts;	5	PC3, PC4	Introduction to Finance	-

33.	Discipline of choice No. 1 from CED	Students are given a choice of elective courses.	6	PC1, PC2, PC3		
34.	Discipline of choice No. 2 from CED	Students are given a choice of elective courses.	6	PC1, PC4, PC5		
35.	Discipline of choice No. 3 from CED	Students are given a choice of elective courses.	6	PC1, PC4, PC5		
36.	Discipline of choice No. 6 from CED	Students are given a choice of elective courses.	6	PC1, PC4, PC5		
37.	Discipline of choice No. 7 from CED	Students are given a choice of elective courses.	4	PC1, PC4, PC5		
38.	Discipline of choice No. 8 from CED	Students are given a choice of elective courses.	6	PC1, PC4, PC5		
39.	Minor 1	Students choose from a list of minors of other EP.	5	PC8		
40.	Minor 2		5	PC8		
41.	Minor 3		5	PC8		

4.4. List of modules and learning outcomes

Name of educational program: "Financial Mathematics"
Qualification: Bachelor in Information and Communication Technologies in the educational program "6B06111 – Financial Mathematics"

Module Code / Module Name	The complexity of the module in credits	Learning outcomes	Criteria for assessing learning outcomes	Module-forming disciplines Code / Name
		GENERAL EDUCATION MODULES		
	5	Discipline has an idea of the principles and laws of the historical development of society, the historical periodization of the history of Kazakhstan, the place of the history of Kazakhstan in the world history and history of Eurasia. He is capable of independently versatile and critical analysis of historical and modern sources, draw conclusions, and reason them.	Oral questioning, testing, report, mid-term control, semester work	The modern history of Kazakhstan
OOM01 Sociology and Ethics	5	Discipline has an idea of the subject, functions, main sections and directions of philosophy; place and role of philosophy in the life of society and man; the main stages of development of world and Kazakh philosophical thought. Able to operate with special philosophical terminology and categorical-conceptual apparatus of philosophy; - creatively and critically work on original philosophical texts; - Logically express your thoughts on the philosophical issues being studied; - analyze the features of the genesis and development of philosophical knowledge; - to form and argue for their own worldview.	Oral questioning, testing, report, mid-term control, semester work	Phylosophy
	2	Discipline has an idea of the subject, functions, main sections and directions of sociology; consists in the presentation of key approaches in the sociology of organizations both at the level of theoretical concepts and models, and at the level of empirical research; in introducing students to basic methods and techniques of research organizations	Oral questioning, testing, report, mid-term control, semester work	Sociology

		Able - to be able to navigate in various sociological approaches to the analysis of organizations and literature for each approach; - gain skills of critical analysis of these approaches (understand their advantages and limitations); - get basic analytical skills of sociological research of organizations; - have an idea of the key research methods of organizations and their limitations.		
	2	He has an understanding of the subject, functions, and main sections; he must understand the basic concepts of politics and political science, the formation of the main political theories and concepts, learn the contribution that various thinkers made to the conceptual understanding of the most important problems of politics and society, the state and government He is able to know the basics of scientific analysis of politics at both theoretical and applied levels, the possibilities of political analysis and forecasting methods for making optimal managerial decisions. Apply theoretical knowledge in real political practice at the level of analysis, examination, consulting, management;	Oral questioning, testing, report, mid-term control, semester work	Political science
	2	Discipline has an idea of the subject, functions, main sections and directions of psychology; the place and role of psychology in the life of society and man; Able to form fundamental knowledge, skills and competencies required in professional activities; - the formation of environmental, physical and ethical, legal culture and a culture of thinking; - language training; - the formation of universal and socio-personal values;	Oral questioning, testing, report, mid-term control, semester work	Psychology
	2	Discipline has an idea about the subject of logically completed elements of the content of the discipline, provides a basis for determining the topics of the course, submitted for verification. Structuring the content of this academic discipline is also a prerequisite for the functioning of the rating system. In addition,	Oral questioning, testing, report, mid-term control,	Cultural studies

	Credits	Learning outcomes	Assessment	Discipline
		such structuring helps the student to formulate a general idea of the development of world culture and systematize their knowledge. Able to give students an idea of the main problems of cultural theory; to reveal the objective laws of world and national cultural processes; to find out the genesis, functioning and development of culture as a specifically human way of life, which reveals itself historically as a process of cultural inheritance; to consider the cultural aspects of various areas of public life; to identify the features of the cultural life of different regions of the world, historical eras, cultural and historical types;	semester work	
	10	Able to characterize - the basic rules of reading; word-building models; contextual meanings of polysemantic words; terms and lexical constructions of the sublanguage corresponding to the profile of the studied specialty; the most frequent specific grammatical phenomena. To understand statements in a foreign language, especially compositional and semantic organization of a scientific text; basic techniques for isolating the main microtext information.	Oral questioning, testing, report, mid-term control, semester work	Foreign language
OOM02 Language training	10	Identify language forms of expression of various types of information of a scientific text for solving problems of educational and professional communication; principles of compiling texts of the main educational, scientific, scientific and professional genres.	Oral questioning, testing, report, mid-term control, semester work	Kazakh (Russian) language
	2	Able to characterize - the basic rules of reading; word-building models; contextual meanings of polysemantic words; terms and lexical constructions of the sublanguage corresponding to the profile of the studied specialty; the most frequent specific grammatical phenomena.	Oral questioning, testing, report, mid-term control, semester work	Foreign language for STEM

	2	To understand statements in a foreign language, especially compositional and semantic organization of a scientific text; basic techniques for isolating the main microtext information. Identify language forms of expression of various types of information of a scientific text for solving problems of educational and professional communication; principles of compiling texts of the main educational, scientific, scientific and professional genres.	Oral questioning, testing, report, mid-term control, semester work	Professional Kazakh language
	4	Able to characterize - the basic rules of reading; word-building models; contextual meanings of polysemantic words; terms and lexical constructions of the sublanguage corresponding to the profile of the studied specialty; the most frequent specific grammatical phenomena. To understand statements in a foreign language, especially compositional and semantic organization of a scientific text; basic techniques for isolating the main microtext information.	Oral questioning, testing, report, mid-term control, semester work	Professionally-oriented foreign language
OOM03 Module of the Information Technology in Science and Production	5	Know: - The main directions of ICT development; - the basics of using information resources for searching and storing information; - architecture and components of computer systems; - The main goals and objectives of information security. Able to work in any operating system and with databases; apply methods and means of information protection; work with spreadsheets, consolidate data, build charts. Have skills: - processing of vector and raster images; - create multimedia presentations; - data visualization; - the use of various forms of e-learning to expand professional knowledge;	Oral questioning, testing, Mid term report control, settlement and graphic work	ICT (Information and communications technology)

Module	Credits	Learning outcomes	Assessment	Discipline
OOM04 Module of the Physical training	8	- work with cloud services of E-technologies. Know the basic tasks of physical education of students, Can pass control exercises and standards.		Physical Culture
	5	Have an idea of the principles and laws of economic relations.	Oral interview, testing, report, milestone control, calculation and graphic works	Fundamentals of economic theory
OOM05 Research and Entrepreneurship Module	5	Have the ability to make independent theoretical and practical judgments and conclusions. Be able to objectively evaluate scientific information, freedom of scientific search and the desire to apply scientific knowledge in educational activities, including for the implementation of a diploma project (work).	Oral interview, report, milestone control	Research methodology
	5	Have an understanding of the principles of law and anti-corruption culture	Oral interview, report, milestone control	Fundamentals of law and anti-corruption culture
	5	Have an idea of the principles and patterns of ecology and life safety	Oral interview, report, milestone control	Fundamentals safety of life activity and ecology
	5	Have an idea of IT competence, entrepreneurial skills	Oral interview, report, milestone control	Startups and entrepreneurship
BASIC MODULES				
BM01 Physics and Mathematics Module	6, 5	Able to describe the basic concepts of linear algebra and analytic geometry; basic fundamental concepts of mathematical analysis; limit theory; theory of continuous functions of one variable; differential calculus of a function of one real variable.	Oral questioning, testing, report, mid-term control, settlement - graphic works	Mathematical Analysis 1, 2
	4	Able to apply methods for solving differential and integral calculus of the function of several variables in applied problems; apply	Oral questioning,	Algebra and geometry

		methods for solving differential equations in solving applied problems; obtain approximate values of solutions by expanding in power series and Fourier series with a given accuracy; determine the best methods for solving practical problems.	testing, report, mid-term control, settlement - graphic works	
	6	Know: probabilistic and statistical methods in science; basic concepts of mathematical statistics; basic methods for constructing estimates; confidence interval construction methods; methods for constructing and testing statistical hypotheses.	Oral questioning, testing, report, mid-term control, settlement - graphic works	Discrete mathematics and mathematical logic
	6	Know: the basic principles, methods and results of modern probability theory and mathematical statistics. Be able to: calculate probabilities of random events and probabilistic characteristics random variables; process statistics; build adequate probabilistic and statistical models of real processes and phenomena, conduct their mathematical analysis; to assess the quality of the obtained solutions of applied problems. Own: methods of the classical theory of probability; the skill of mathematical formalization of applied problems, analysis and interpretation of the solutions of the corresponding mathematical models.	Oral questioning, testing, report, mid-term control, settlement - graphic works	Probability theory
	6	Know: the basic concepts of the theory of differential equations, types and standard forms of writing of the basic differential equations, methods for solving the basic differential equations. To be able to: use differential equations for modeling physical processes, use the means of differential equations to process, analyze and systematize information on the topic of research and use, if necessary, mathematical literature.	Oral questioning, testing, report, mid-term control, settlement - graphic works	Differential equation

Module	Credits	Learning outcomes	Assessment methods	Discipline
	6	The aim of the course is to develop familiarity with a wide range of statistical and econometric techniques that have proved to be useful in applied contexts. Theoretical results will be developed as necessary in order to allow students to apply general principles to their own research problems.		Econometrics
BM02 Mathematical Modeling Module	6	Knows and uses in modeling Fundamentals of the theory of errors, Systems of linear algebraic equations, Nonlinear equations and systems of nonlinear equations, Interpolation and best approximations, Differentiation and integration of functions, Ordinary differential equations, Equations of mathematical physics.	Oral questioning, testing, report, mid-term control, settlement - graphic works	Computational Mathematics
	6	Knows and uses in modeling Nonlinear equations and systems of nonlinear equations, Interpolation and best approximations, Differentiation and integration of functions, Ordinary differential equations, Equations of mathematical physics.	Oral questioning, testing, report, mid-term control, settlement - graphic works	Numerical methods of analysis and algebra
BM03 Computer simulation module	6	Know: organize, depending on the requirements of the task, the necessary data structures; Be able to: develop structural diagrams of various algorithms; Have skills: develop C ++ programs using language tools.	Oral questioning, testing, report, mid-term control, settlement - graphic works	Introduction to Programming
	6	Be able to develop sorting algorithms such as bubble sort, merge sort, quick sort, etc. Have the basics of OOP concepts, C ++ theory, methods and technologies, data structures and algorithms; application of algorithms and current trends in technologies of a large company	Oral questioning, testing, report, mid-term control, settlement - graphic works	Object oriented programming

	Description	Assessment	Subject
6	Able to know: basic algorithms for solving biological processes of various nature; Able to use tools of a programming language to solve biological problems and be able to perform data analysis, identify trends. Have skills: implementing algorithms and data structures, as well as using the functions of a programming language using modern software	Oral questioning, testing, report, mid-term control, settlement - graphic works	Algorithms and data structures
3	Знать: язык программирования Python для работы с геномными данными; операционную систему Unix и команды для работы в данной среде; скриптовые языки и методах написания программных кодов на них. Владеет навыками разработки программ для анализа генов и геномов, использования других дополнительных пакетов, таких как Biopython, R, Bioconductor и Galaxy.	Oral questioning, testing, report, mid-term control, settlement - graphic works	Python Programming
3	An idea: a critical analysis and evaluation of modern scientific achievements, the generation of new ideas in solving research and practical problems, including in interdisciplinary fields.	Oral questioning, testing, report, mid-term control, settlement - graphic works	3D Modeling and Design
5	Know the basics of machine learning theory, including discriminant, cluster and regression analysis, mastery of skills for practical solving data mining problems.	Oral questioning, testing, report, mid-term control, settlement - graphic works	Machine Learning

Credits	Competency	Assessment forms	Discipline
5	Able to apply programming skills to build predictive models, data visualization and work with neural networks.	Oral questioning, testing, report, mid-term control, settlement - graphic works	Python for data analysis

PROFESSIONAL MODULES

Credits	Competency	Assessment forms	Discipline
PM01 Module of the Elective Disciplines	Professional skills	Oral questioning, testing, report, mid-term control, settlement - graphic works	
5			Corporate Finance
5			Financial markets and intermediaries
5			Financial risk management
5			FinTech & Blockchain Basics
6			Financial modeling
5			Banking and insurance
4			Discipline of choice No. 7 from CED
6			Discipline of choice No.8 from CED
PM02 Module of financial disciplines	Able to conduct statistical studies of populations. He owns a set of modern methods of collecting, processing and summarizing statistical information to study trends and patterns of socio-economic phenomena and processes. He owns the apparatus by profession and knows its applied disciplines aimed at developing professional competencies. This module has theoretical knowledge and practical skills in the use of derivative financial instruments. Knows types of derivative financial instruments. He knows the principles of organizing trading in the futures and	Oral questioning, testing, report, mid-term control, settlement - graphic works	Statistics
5			
5			Intriduction to Finance
5			Derivative financial instruments

		Report	Training practice
			Internship
			Undergraduate practice
PM03 Practice module	option contracts market.		
	2	He knows the organizational structure and complex of technical means of the information-analytical center (IAC) of the organization. Able to identify the main tasks solved by the IAC.	
	4, 4		
	5	He knows the mathematical support of the selected task (task complex or subsystem) and the software of the selected task (task complex or subsystem), the organizational and legal support of the selected task (task complex or subsystem). systematization and analysis of the actual materials necessary for writing a term paper, a scientific report and a practice report.	
PM04 The module of Minor disciplines	5, 5, 5	He is able to apply the acquired knowledge according to the selected additional educational program.	Oral interview, testing, report, boundary control
			Minor 1, 2, 3

5. The curriculum of the educational program "Financial Mathematics"

№	Module code	Module name in three languages (kaz / rus / eng)	Discipline Code	Discipline name in three languages (kaz / rus / eng)	Cycles (GED, CD, M)	Components (RC, OC, UC)	Total number of credits (ECTS)	Total number of academic hours	Number of classroom hours				Number of SIS hours		Form of control (Midterm, End-of-term, examination, CP defense, differential test, DP defense)	Prerequisites (Discipline Code)
									Total number of classroom hours	lectures	practical classes (sem.)	laboratory classes	Total number of SIS hours	Including TSIS		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
				1 year **1 semester**												
1	OOM02	Тілдік дайындық / Языковая подготовка / Language training	LAN6001A	Шет тілі / Иностранный язык / Foreign language	CGS	RC	5	150	45	0	45	0	105	15	M, E, Exam	-
2	OOM03	Ақпараттық технологиялар модулі / Модуль информационных технологий / Information Technology Module	ICT6001	Ақпараттық-коммуникациялық технологиялар / Информационно-коммуникационные технологии / Information and Communication Technologies	CGS	RC	5	150	45	15	0	30	105	15	M, E, Exam	-
3	БМ01	Физика - математикалық Модуль / Модуль Физико- математический / The Physics and Mathematics module	MAT6001	Алгебра және геометрия / Алгебра и геометрия / Algebra and Geometry	BD	UC	4	120	45	15	30	0	75	15	M, E, Exam	-
4	БМ03	Компьютерлік моделдеу модулі / Модуль компьютерного моделирования / Computer simulation module	SFT6001	Бағдарламалауға кіріспе / Введение в программирование / Introduction to Programming	BD	UC	6	180	60	15	15	30	120	15	M, E, Exam	-
5	БМ03	Компьютерлік моделдеу модулі / Модуль компьютерного моделирования / Computer simulation module	SFT6558	WEB технологиялары / WEB технологии / WEB technology	BD	UC	6	180	60	15	15	30	120	15	M, E, Exam	-
6	БМ01	Физика - математикалық Модуль / Модуль Физико- математический / The Physics and Mathematics module	MAT6509	Дискреттік математика және математикалық логика / Дискретная математика и математическая логика / Discrete Mathematics and Mathematical Logic	BD	CC	6	180	60	30	30	0	120	15	M, E, Exam	-

№	Код / Code	Модуль / Module	Пән коды / Code	Пән / Discipline											Бақылау / Control	
		Total number for a 1 semester:					32	960	315	90	135	90	645	90		
		2 year														
7	ООМ02	Тілдік дайындық / Языковая подготовка / Language training	LAN6002A	Шет тілі / Иностранный язык / Foreign language	CGS	RC	5	150	45	0	45	0	105	15	M, E, Exam	-
8	ООМ04	Дене шынықтыру модулі / Модуль физической подготовки / Physical training module	PhC6005	Дене шынықтыру / Физическая культура / Physical Culture	CGS	RC	4	120	45	0	45	0	75	15	M, E, dif.test	-
9	БМ01	Физика - математикалық Модуль / Модуль Физико- математический / The Physics and Mathematics module	MAT6501	Математикалық талдау 1 / Математический анализ 1 / Mathematical analysis 1	BD	UC	6	180	60	30	30	0	120	15	M, E, Exam	-
10	РМ02	Каржы пәндерінің модулі / Модуль финансовых дисциплин / Module of financial disciplines	MAT6548	Каржыға кіріспе / Введение в финансы / Introduction to Finance	BD	UC	4	120	45	15	30	0	75	15	M, E, Exam	-
11	ПМ03	Тәжірибе модулі / Модуль практик / The Practice module	PP6501	Оқыту практика / Учебная практика / Teaching practice	BD	UC	2	60	30	0	30	0	30	0	Dif.test	-
12	БМ01	Физика - математикалық Модуль / Модуль Физико- математический / The Physics and Mathematics module	MAT6520	Ықтималдық теориясы / Теория вероятности / Probability Theory	BD	CC	3	90	30	15	15	0	60	15	M, E, Exam	-
13	БМ03	Компьютерлік модельдеу модулі / Модуль компьютерного моделирования / Computer simulation module	SFT6516	Python бағдарламалау / Программирование на Python / Programming in Python	BD	CC	4	120	45	15	0	30	75	15	M, E, Exam	-
		Total number for a 2 semester:					28	840	300	75	195	30	540	90		
		TOTAL NUMBER FOR THE 1 YEAR:					60	1800	615	165	330	120	1185	180		
		3 semester														
		2 year														
14	ООМ02	Тілдік дайындық / Языковая подготовка / Language training	LAN6001KR	Казак (орыс) тілі / Казахский (русский) язык / Kazakh (Russian) language	CGS	RC	5	150	45	0	45	0	105	15	M, E, Exam	-
15	ООМ01	Әлеуметтану және этика / Социологии и этики / Sociology and Ethics	HK6002	Казакстан тарихы / История Казахстана / History of Kazakhstan	CGS	RC	5	150	45	15	30	0	105	15	M, E, Exam	-
16	ООМ04	Дене шынықтыру модулі / Модуль физической подготовки / Physical training module	PhC6006	Дене шынықтыру / Физическая культура / Physical Culture	CGS	RC	4	120	45	0	45	0	75	15	M, E, dif.test	-
17	БМ01	Физика - математикалық Модуль / Модуль Физико- математический / The Physics and Mathematics module	MAT6502	Математикалық талдау 2 / Математический анализ 2 / Mathematical analysis 2	BD	UC	5	150	45	15	30	0	105	15	M, E, Exam	MA T65 01
18	БМ03	Компьютерлік модельдеу модулі / Модуль компьютерного моделирования / Computer simulation module	SFT6517	Объектілі-бағдарланған программалау / Объектно-ориентированное программирование / Object-oriented programming	BD	UC	7	210	75	30	15	30	135	15	M, E, Exam	SFT 600 1

№	Module code	Module name	Code	Discipline	BD	UC	Cr.	Total	Aud.	Lec.	Pr.	Lab	IWS	IWST	Form	Prereq.
19	БМ01	Физика - математикалық Модуль / Модуль Физико- математический / The Physics and Mathematics module	MAT6531	Дифференциалдық теңдеулер / Дифференциальные уравнения / Differential Equations	BD	UC	5	150	45	15	30	0	105	15	M, E, Exam	MAT6501
				Total number for a 3 semester:			31	930	300	60	210	30	630	90		

4 semester

№	Module code	Module name	Code	Discipline	BD	UC	Cr.	Total	Aud.	Lec.	Pr.	Lab	IWS	IWST	Form	Prereq.
20	ООМ02	Тілдік дайындық / Языковая подготовка / Language training	LAN6002KR	Қазақ (орыс) тілі / Казахский (русский) язык / Kazakh (Russian) language	CGS	RC	5	150	45	0	45	0	105	15	M, E, Exam	-
21	ООМ01	Әлеуметтану және этика / Социологии и этики / Sociology and Ethics	SPS6003	Саясаттану / Политология / Political science	CGS	RC	2	60	30	15	15	0	30	15	M, E, Exam	-
22	ООМ01	Әлеуметтану және этика / Социологии и этики / Sociology and Ethics	SPS6002	Әлеуметтану / Социология / Sociology	CGS	RC	2	60	30	15	15	0	30	15	M, E, Exam	-
23	БМ03	Компьютерлік модельдеу модулі / Модуль компьютерного моделирования / Computer simulation module	SFT6501	Алгоритмдер және деректер құрылымы / Алгоритмы и структуры данных / Algorithms and data structures	BD	UC	6	180	60	15	15	30	120	15	M, E, Exam	SFT6517
24	БМ02	Математикалық модельдеу модулі / Модуль математического моделирования / Mathematical modeling module	MAT6534	Есептеу математикасы / Вычислительная математика / Computational mathematics	BD	UC	5	150	45	15	15	15	105	15	M, E, Exam	MAT6531
25	ПМ03	Тәжірибе модулі / Модуль практик / The Practice module	PP6502	Өндірістік практика / Производственная практика / Industrial practice	MD	UC	4	120	0	0	0	0	120	15	report	-
26	РМ02	Қаржы пәндерінің модулі / Модуль финансовых дисциплин / Module of financial disciplines	MAT6544	Статистика / Статистика / Statistics	BD	CC	5	150	45	15	30	0	105	15	M, E, Exam	MAT6520
				Total number for a 4 semester:			29	870	255	75	135	45	615	105		
				TOTAL NUMBER FOR THE 2 YEAR:			60	1800	555	135	345	75	1245	195		

3 year

5 semester

№	Module code	Module name	Code	Discipline	BD	UC	Cr.	Total	Aud.	Lec.	Pr.	Lab	IWS	IWST	Form	Prereq.
27	ООМ01	Әлеуметтану және этика / Социологии и этики / Sociology and Ethics	SPS6005	Психология / Психология / Psychology	CGS	RC	2	60	30	15	15	0	30	15	M, E, Exam	-
28	ООМ01	Әлеуметтану және этика / Социологии и этики / Sociology and Ethics	SPS6004	Мәдениеттану / Культурология / Cultural studies	CGS	RC	2	60	30	15	15	0	30	15	M, E, Exam	-
29	РМ01	Таңдау пәндерінің модулі / Модуль элективных дисциплин / Module of elective disciplines	FIN6702	Корпоративтік қаржы / Корпоративные финансы / Corporate Finance	BD	CC	5	150	45	15	30	0	105	15	M, E, Exam	MAT6548

the Elective Disciplines

№	Code	Module	Discipline	Cycle	Comp.	Credits	Total	Contact	Lec	Pract	Lab	SRO		Control	Prereq.
30	ООМ02 / LAN6002PA	Тілдік дайындық / Языковая подготовка / Language training	Кәсіби бағытталған шет тілі / Профессионально-ориентированный иностранный язык / Professionally oriented foreign language	BD	CC	4	120	45	0	45	0	75	15	M, E, Exam	-
31	БМ03 / SFT6503	Компьютерлік модельдеу модулі / Модуль компьютерного моделирования / Computer simulation module	Деректерді талдауға арналған Python / Python для анализа данных / Python for Data Analysis	BD	CC	5	150	45	15	0	30	105	15	M, E, Exam	SFT 651 6
32	БМ01 / MAT6552	Физика - математикалық Модуль / Модуль Физико-математический / The Physics and Mathematics module	Эконометрика / Эконометрика / Econometrics	BD	CC	6	180	60	30	30	0	120	15	M, E, Exam	
33	ПМ04 / MIN601	Майнор пәндер модулі / Модуль Майнор дисциплин / The module of Minor disciplines	Майнор 1 / Майнор 1 / Minor 1	MD	CC	5	150	45	15	15	15	105	15	M, E, Exam	-
			Total number for a 5 semester:			29	870	300	105	150	45	570	105		

6 semester

№	Code	Module	Discipline	Cycle	Comp.	Credits	Total	Contact	Lec	Pract	Lab	SRO		Control	Prereq.
34	ООМ01 / SPS6001	Әлеуметтану және этика / Социологии и этики / Sociology and Ethics	Философия / Философия / Philosophy	CGS	RC	5	150	45	15	30	0	105	15	M, E, Exam	-
35	ПМ01 / FIN6704	Таңдау пәндерінің модулі / Модуль элективных дисциплин / Module of the Elective Disciplines	Қаржы нарықтары және делдалдар / Финансовые рынки и посредники / Financial markets and intermediaries	BD	CC	5	150	45	15	30	0	105	15	M, E, Exam	
36	ПМ03 / PP6503	Тәжірибе модулі / Модуль практик / The Practice module	Өндірістік практика / Производственная практика / Professional Internship	MD	UC	4	120	0	0	0	0	120	15	report	
37	БМ03 / SFT6505	Компьютерлік модельдеу модулі / Модуль компьютерного моделирования / Computer simulation module	Машиналық оқыту / Машинное обучение / Machine Learning	BD	CC	5	150	45	15	0	30	105	15	M, E, Exam	SFT 650 3
38	ПМ01 / MAT6553	Таңдау пәндерінің модулі / Модуль элективных дисциплин / Module of the Elective Disciplines	Қаржылық тәуекелдерді басқару / Финансовый риск-менеджмент / Financial risk management	BD	CC	5	150	45	15	30	0	105	15	M, E, Exam	
39	ООМ02 / LAN6004DA	Тілдік дайындық / Языковая подготовка / Language training	STEM арналған ағылшын тілі / Английский язык для STEM / English for STEM	BD	CC	2	60	30	0	30	0	30	15	M, E, Exam	-
40	ПМ04 / MIN602	Майнор пәндер модулі / Модуль Майнор дисциплин / The module of Minor disciplines	Майнор 2 / Майнор 2 / Minor 2	MD	CC	5	150	45	15	15	15	105	15	M, E, Exam	MI N60 1
			Total number for a 6 semester:			31	930	255	75	13 0	45	675	105		

TOTAL NUMBER FOR THE 3 YEAR: 60   1800   555   180   285   90   1245   210

4 year

7 semester

№	Module code	Module	Course code	Course name			60	1800	555	180	285	90	1245	210		
41	ООМ02	Тілдік дайындық / Языковая подготовка / Language training	LAN6007K	Мемлекеттік тілде іс қағаздарын жүргізу / Делопроизводство на государственном языке / Business correspondence in the state language	BD	UC	2	60	30	0	30	0	30	15	M, E, Exam	LAN6002KR
42	ПМ02	Деректерді талдау модулі / Модуль Анализа данных / Data Analysis Module	MAT6538	Операцияларды зерттеу / Исследование операции / Operation research	BD	CC	5	150	45	15	15	15	105	15	M, E, Exam	MAT6506
43	ООМ05	Зерттеу және кәсіпкерлік модулі / Модуль исследований и предпринимательства / Research and Entrepreneurship Module	RM6502	Зерттеу әдістемесі / Методология исследования / Research metodology	CGS	CC	5	150	45	15	30	0	105	15	M, E, Exam	-
			JUR 6507	Тіршілік қауіпсіздігінің және экологияның негіздері / Основы экологии и безопасности жизнедеятельности / Fundamentals safety of life activity and ecology												
			JUR 6470	Заң және сыбайлас жемқорлыққа қарсы мәдениеттің негіздері / Основы права и антикоррупционной культуры / Fundamentals of law and anti-corruption culture												
			MGT6706	Стартаптар және кәсіпкерлік / Стартапы и предпринимательство / Startups and entrepreneurship												
			ECO6006	Экономикалық теория / Экономическая теория / Economic theory												
44	ВМ02	Математикалық модельдеу модулі / Модуль математического моделирования / Mathematical Modeling Module	MAT6505	Анализ және алгебра сандық әдістері / Численные методы анализа и алгебры / Numerical methods of analysis and algebra	MD	CC	6	180	60	15	15	30	120	15	M, E, Exam	
45	РМ02	Каржылық пәндер модулі / Модуль финансовых дисциплин / Module of financial disciplines	MAT6511	Туынды қаржы құралдары / Производные финансовые инструменты / Derivative financial instruments	BD	UC	5	150	45	15	30	0	105	15	M, E, Exam	
46	РМ01	Таңдау пәндерінің модулі / Модуль элективных дисциплин / Module of the Elective Disciplines	FIN6513	FinTech & Blockchain негіздері / Основы FinTech & Blockchain / FinTech & Blockchain Basics	MD	CC	5	150	45	15	30	0	105	15	M, E, Exam	
47	ПМ04	Майнор пәндер модулі / Модуль Майнор дисциплин / The module of Minor disciplines	MIN603	Майнор 3 / Майнор 3 / Minor 3	MD	CC	5	150	45	15	15	15	105	15	M, E, Exam	MIN6002

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№	Code	Module / Discipline	Cycle	Comp.	Credits	990	315	90	165	60	675	105	Form	Note
		Total number for a 7 semester:			33	990	315	90	165	60	675	105		
		8 semester												
48	ПМ03 PP6504	Тәжірибе модулі / Модуль практик / The Practice module — Диплом алдындағы практика / Преддипломная практика / Pregraduation practice	MD	UC	5	150	0	0	0	0	150	15	report	
49	ПМ02 SFT6506	Деректерді талдау модулі / Модуль Анализа данных / Data Analysis Module — Power BI деректерді талдау және визуализациялау / Анализ и визуализация данных в Power BI / Data analysis and visualization in Power BI	BD	CC	3	90	30	0	30	0	60	15	M, E, Exam	-
50	PM01 FIN6511	Таңдау пәндерінің модулі / Модуль элективных дисциплин / Module of the Elective Disciplines — Қаржылық модельдеу Финансовое моделирование / Financial modeling	MD	CC	6	180	60	30	30	0	120	15	M, E, Exam	
51	PM01 FIN6512	Таңдау пәндерінің модулі / Модуль элективных дисциплин / Module of the Elective Disciplines — Банк және сақтандыру ісі / Банковское и страховое дело / Banking and insurance	MD	CC	5	150	45	15	30	0	105	15	M, E, Exam	
52		Дипломдық жұмысты, дипломдық жобаны жазу және қорғау немесе кешенді емтиханды дайындау және тапсыру / Написание и защита дипломной работы, дипломного проекта или подготовка и сдача комплексного экзамена / Writing and defending a diploma thesis, diploma project or preparation and passing of a comprehensive exam			8	240	0	0	0	0	240	15	DP Defence	
		Total number for a 8 semester:			27	810	135	45	90	0	675	75		
		TOTAL NUMBER FOR THE 4 YEAR:			60	1800	450	135	255	60	1350	180		
		TOTAL:			240	7200	2175	615	1215	345	5025	765		

Summary table of indicators of the academic program's number of credits in the context of cycles of disciplines and semesters

Cycles of disciplines / Semester	1 sem.	2 sem.	3 sem.	4 sem.	5 sem.	6 sem.	7 sem.	8 sem.	Total number of credits ECTS	Note (AP structure according to the National

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										Mandatory Standards of Higher and Post-Graduate Education)
Cycle of general education disciplines (GED)	10	9	14	9	4	5	5		56	* 56 cr.
- including the required component (GED RC)	10	9	14	9	4	5			51	* 51 cr.
- including optional component (GED OC)							5		5	* 5 cr.
Cycle of core disciplines (CD)	22	19	17	16	20	17	12	3	126	**
- including the university component (CD UC)	16	12	17	11			5		61	
- including optional component (CD OC)	6	7		5	20	17	7	3	65	
Cycle of majors (M)				4	5	9	16	16	50	**
- including the university component (M UC)				4		4		5	13	
- including optional component (M OC)					5	5	16	11	37	
Professional internship (PI)		2		4	4			5	15	
Additional types of training										
Final attestation (FA)								8	8	*Not less than 8 cr.
TOTAL number of credits for the academic program	32	28	31	29	29	31	33	27	240	Not less than 240 cr.

*The cycle of core disciplines and majors (CD, M) is not less than 176 cr.

**The cycle of core disciplines and majors (CD, M) is not less than 176 cr.

6. Additional educational programs (Minor)

The name of the additional educational program (Minor) with an indication of the list of disciplines that form Minor	Total number of credits / number of credits by discipline	Semesters of study	Documents following the results of the development of additional educational programs (Minor)
Business & Enterpreneurship			
MGT6706 Startups and entrepreneurship	5	5	Transcript
(kv 5)MGT6714 International Business	5	6	Transcript
MGT6711 Production and Sales Management	5	7	Transcript
Accounting by ACCA			
ACC6701 Business Technology (ACCA)	5	5	Transcript
ACC6702 Financial Accounting	5	6	Transcript
ACC6703 Management Accounting	5	7	Transcript
Management & Leadership			
MGT6701 Management	5	5	Transcript
MGT6707 Psychology of Management	5	6	Transcript
MGT6702 Organizational Behavior and Leadership	5	7	Transcript
Digital Marketing & E-commerce			
MRK6701 Marketing	5	5	Transcript
MGT6709 Fundamentals of E-Commerce	5	6	Transcript
MRK6702 Digital Marketing and Brand Management	5	7	Transcript

7. Approval sheet with developers

The name of the educational program: 6B06111 "Financial Mathematics"

№	Position, academic or academic degree and Surname IO educational program developer	Date	Signature	Notes
1	Assistant Professor, PhD Ydyrys A.Zh.			
2	Assistant Professor, PhD Maulenov A.O.			
3	Senior Lecturer, Master Marat G.S.			