MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute"

CURRICULUM

(Enrolment 2017)

APPROVED
by Rector of Igor Sikorsky Kyiv Polytechnic Institute

_____ Michael Zgurovsky

_____ 2017

Level Bachelor

Speciality 124 System Analysis

Specialization System Analysis of Financial Market

Graduation Department Mathematical Methods for System Analysis

Form of study Full-time (full-time, part-time)

Faculty (Institute) Institute for Applied System Analysis

Qualification Associate Professional in System Analysis

Study duration 3 years 10 months

Base level Full secondary education

I. Schedule of educational process

YEAR	September				October					November					December				January					January				March				April				May				June				July					August			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
I																			E	E	H	H																			E	E	H	H	H	H	H	H	H	H	H	H
II																			E	E	H	H																			E	E	H	H	H	H	H	H	H	H	H	H
III																			E	E	H	H																			E	E	H	H	H	H	H	H	H	H	H	H
IV																			E	E	H	H										E	P	P	P	P	P	R	R	R	R	A	A									

Symbols: Learning period; E Examination; P Practice; R Research; A Assessment; H Holiday

II. Summary table of time budget (Weeks)

YEAR	Learning period	Examination	Practice	Assessment	Research	Holiday	Total
I	36	4				12	52
II	36	4				12	52
III	36	5				11	52
IV	27	3	5	2	4	2	43

III. Practice

Type of practice	YEAR	Weeks
Pre-Diploma Practice	IV	3

IV. Graduates assessment

Subjects	Form of graduates assessment (exam, graduation project)	YEAR
	Diploma Project	IV

V. Plan of Educational process

Code	Subjects	Distribution for terms (semesters)				ECTS Credits	Number of hours				
		Exams	Final tests	Course projects	Coursework		Total	Lectures/practical lessons			Self-study
								Lectures	Practical	Laboratory	
1	2	3	4	5	6	7	8	9	10	11	12
I. GENERAL TRAINING											
I.1. Natural-scientific training											
1/I	Algebra and Geometry: 1. Analytic Geometry 2. Linear Algebra	2	1d			9	270	72	72		126
2/I	Discrete Mathematics: 1. Statements, Sets, Relations, Graphs, Combinatorics, Groups, Rings 2. Partially Ordered Sets, Lattices, Boolean Algebra	1	2			6	180	54	72		54
3/I	Mathematical Analysis: 1. Differential Calculus of Functions of One Real Variable 2. Differential Calculus of Functions of Several Real Variables. Integration of Functions of One Variable	1,2,3				16	480	162	144		174
4/I	Physics: 1. Physical Grounds of Mechanics 2. Electricity and Magnetism	2	3			8	240	72	72		96
5/I	Differential Equations	3				4	120	36	36		48
6/I	Probability Theory	3				4	120	36	36		48
7/I	Functional Analysis	5				4	120	36	36		48
	total number of part I.1	**9**	**3**			**51**	**1530**	**468**	**468**		**594**
I.2. Basic training (major courses)											
1/II	Programming and Algorithmic Languages: 1. Algorithms and Basics of Programming 2. Programming Course Work	1	2d		2	10	300	90		72	138
2/II	Numerical Methods: 1. Solution of Equations and Systems, Function Approximation 2. Calculation of Eigen Pairs of a Matrix. Solution of Differential Equations	4	5			6.5	195	72		36	87
3/II	Methods of Optimization and Operations Research: 1. Analytical Methods of Optimization 2. Numerical Methods of Optimization	5	6d			6.5	195	54	18	18	105
4/II	Control Theory: 1. Nonlinear Dynamical System Analysis 2. Control System Design	6	7d			6.5	195	72		18	105
5/II	Basic of System Analysis: 1. Main Notions of System Analysis, Theoretical Basis for Interdisciplinary Problem Solution 2. Models, Approaches, Methods and Algorithms for Solving System Analysis Problems	7, 8				7	210	72	18		120
6/II	Economics of Organization and Production Planning: 1. Fundamentals of Economic Theory 2. Economics and Production Organization		5, 6			4	120	36	36		48
7/II	Subjects on Life Safety		6			2	60	18	18		24
8/II	Decision Theory: 1. Decision Making under an Influence of Random Factors and Uncertainties 2. Collective Choice Theory and Decision-Making in Counteraction Environment	8	7		7	7.5	225	81	18		126
	total number of part I.2	**7**	**8**		**2**	**50**	**1500**	**495**	**108**	**144**	**753**
I.3. Basic training (optional courses)											
1/III	Knowledge and Databases Organization: 1. Relational Data Base Design 2. Implementation of Information Systems	6	5		6	7.5	225	54		36	135
2/III	Algorithms and Data Structures		1			4	120	36		36	48
	total number of part I.3	**1**	**2**		**1**	**11.5**	**345**	**90**		**72**	**183**

Code	Subjects	Distribution for terms (semesters)				ECTS Credits	Number of hours				
		Exams	Final tests	Course projects	Coursework		Total	Lectures/practical lessons			Self-study
								Lectures	Practical	Laboratory	
1	2	3	4	5	6	7	8	9	10	11	12
I.4. Humanities training (optional courses)											
1/IV	History Subjects		2			2	60	18	18		24
2/IV	Ukrainian Language Subjects		1			2	60	18	18		24
3/IV	Philosophy Subjects		4			2	60	18	18		24
4/IV	Psychology Subjects		4			2	60	18	18		24
5/IV	Subjects on Law		6			2	60	18	18		24
6/IV	Subjects on Humanities and Social Science # 1		5			2	60	18	18		24
7/IV	Subjects on Humanities and Social Science # 2		7			2	60	18	18		24
8/IV	Foreign Language		2, 4d			6	180		144		36
9/IV	Foreign Language for Professional Purposes		6, 7d			4	120		90		30
	total number of part I.4		**11**			**24**	**720**	**126**	**360**		**234**
	TOTAL IN GENERAL TRAINING	**17**	**24**		**3**	**136.5**	**4095**	**1179**	**936**	**216**	**1764**
II. VOCATIONAL TRAINING											
II.1. Vocational and practical training (major courses)											
1/c	Mathematical Logics and Algorithms Theory		2d, 3d			5.5	165	54	36		75
2/c	Investment Analysis		4d			3	90	36		18	36
3/c	Computer Systems Architecture		3			3	90	36	18		36
4/c	Operating Systems		4			3	90	36		18	36
5/c	Mathematical Physics Equations	5				4	120	54	18		48
6/c	Mathematical Statistics		4			3	90	36	18		36
7/c	Object-Oriented Programming		3d		3	6	180	54		36	90
8/c	Theory of Information and Coding		4			3	90	36	18		36
9/c	IT-Project Management	4				4.5	135	36	36		63
10/c	Game Theory and Operations Research		6d			3	90	36	18		36
11/c	Random Processes Theory	6				4	120	36	18		66
12/c	Computer Networks		6			3.5	105	36		18	51
13/c	Time Series Analysis	7				4	120	36	18		66
14/c	Statistical Analysis and Economic Processes Forecasting		6			3.5	105	36	18		51
15/c	Artificial Intelligence Methods	7				4	120	36	18		66
16/c	Advanced Systems Modeling and Simulation	8				4	120	36		9	75
17/c	Analysis of Economic and Financial Risks		8d			3.5	105	36	18		51
18/c	Networks Modeling and Simulation		7			3	90	36	18		36
	total numberof part II.1	**6**	**13**		**1**	**67.5**	**2025**	**702**	**270**	**99**	**954**
II.2. Vocational and practical training (optional courses)											
1/св	Financial Theory		2			3	90	18	18		54
2/св	Neural Networks	4				4	120	36	18		66
3/св	Applied Statistics		5d			4.5	135	36	36		63
4/св	Micro- and Macroeconomic Systems		5			3	90	36	18		36
5/св	Social and Ethic Aspects for Information Technologies		1			3	90	36	18		36
6/св	Big Data Analysis and Control		7			5	150	36	36		78
7/св	Pre-Diploma Practice		8d			7.5	225				225
8/св	Diploma Project					6	180				180
	total number of part II.2	**1**	**5**			**36**	**1080**	**198**	**144**		**738**
	TOTAL IN VOCATIONAL TRAINING	**7**	**18**		**1**	**103.5**	**3105**	**900**	**414**	**99**	**1692**
	TOTAL	**24**	**42**		**4**	**240.0**	**7200**	**2079**	**1350**	**315**	**3456**

Approved by Faculty Academic Council, Meeting protocol № ____ from April 25, 2017

Head of the Department _____ O.L.Tymoschuk

Dean of the Faculty (Director of the Institute) _____ V.D.Romanenko