

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE NATIONAL TECHNICAL UNIVERSITY "KHARKIV POLYTECHNIC INSTITUTE"

CURRICULUM

educational and professional program



I. Schedule of education process

urse	S	Sept	em	ıbe	ər	(Oct	tob	er			I	No	ven	۱be	er			D	ece	mb	er			J	anu	lary	y			F	ebr	uar	y			Nar	ch				Apri	il				Мау	/				Jun	е				July	/			Au	igus	st	_
õ	1	2	2	3	4	5	6	7	,	8	9	1(0	11		12	13	3 1	4	15	16	17	1	8	19	20)	21	22	2	23	24	25	26	5 2	7 2	28	29	30	31	3	32 3	33	34	35	36	37	38	39	40	41	4	2	43	44	45	46	6 47	48	49	50) 5 ⁻	1 5	,2
Τ																						s		Е	Е	E		٧	۷	,	V	Ρ	Ρ																	s	Е	E	=	Е	V	V	V	V	V	V	V	/ \	/	v
Ш																						S		E	Е	E		V	V	,	V																			S	Е	E	Ξ	Е	V	V	V	V	V	V	V	′ \	/ `	V
Ш																						s		E	Е	E		V	V	`	V																			s	Е	E	Ξ	Е	V	V	V	V	V	V	V	۷ V	/	V
IV																						S		E	Е	E		V	V	`	V													Е	Е	Ρ	Ρ	Ρ	Ρ	Q	Q)	D										_

Notation:

Theoretical training S Score week Ε

Examination session

Theoretical and practical training Ρ Practice **Q** Preparing a qualifying paper and/or exam

D Defense of qualification work υ Unified state gualification exam C Certification exam

V Vacations

II. Consolidated budget time (in weeks)

Course	Theoretical study	Exam Session	Practice	Attestation	Preparation of qualification work	Vacation	Total
I	30	8	2			12	52
П	32	8				12	52
	32	8				12	52
IV	26	6	4	2	2	3	43
Total	120	30	6	2	2	39	199

III. Practice

Semester
6
8
2

IV. Attestation

Measures	Number of ECTS credits	Semester
Preparing a qualifying paper and/or exam	3,0	8
Defense of qualification work	3,0	8
Attestation		8
Proficiency examination		8

CURRICULUM CONTENT

training of the first (bachelor's) level:

by specialty

123

Computer Engineering

			Total num	ber		Doportmont
№ з/п	Name of the educational component	ECTS credits	Hours	Sem	esters	code
		EOTO OTOMIO	Tiouro	exam.	offset	
1	2	3	4	5	6	7
1	Obligatory educational components	159,0	4770,0			66,25%
1.1	General training	62,0	1860,0			39%
GT 1	History and Culture of Ukraine	4,0	120,0	1		310
GT2 CT2	Foreign Language in Professional Field	3,0	90,0	2	10	275
	Ukrainian Language (for professional purposes)	4,0	120,0	2	1,2	2/3
GT 5		4,0	120,0	1		307
GT6	FilySics Higher Mathematics n 1	5,0	180.0		1	324
GT 7	Higher Mathematics p.2	5.0	150.0	2		324
GT 8	Discrete Mathematics	6.0	180,0	2		326
GT 9	Probability Theory	4,0	120,0	3		326
GT 10	Computer Electronics	5,0	150,0	4		326
GT 11	Foreign Language for Professional Communications	4,0	120,0	8	7	273
GT	Physical education	12,0	360,0		1 - 6	302
1.2	Professional training	97,0	2910,0			61%
SP 1	Algebra for Programming	3,0	90,0	1		326
SP 2	Introduction to Specialty. Fundamentals of Computer Engineering	3,0	90,0	1		326
SP 3	Programming p.1	5,0	150,0	1		326
SP 4	Programming p.2	5,0	150,0	2		326
525 50 f	Algorithms and Data Structures	5,0	150,0	3		326
3F 0 SP 7	Database Organization and Design	4,0	120,0	3		320
SP 8	Object-oriented Programming n 1	3,0 4 0	120.0	3	3	320
SP 9	Object-oriented Programming p.1	4.0	120,0	4	5	326
SP 10	System Programming	5.0	150.0	4		326
SP 11	Computer Graphics	4,0	120,0	· · ·	4	326
SP 12	Database Development and Application	4,0	120,0	4		326
SP 13	System Software	5,0	150,0	5		326
SP 14	Computer Circuitry	4,0	120,0	5		326
SP 15	Computer Networks	5,0	150,0	5		326
SP 16	Microprocessors Architecture and Programming	4,0	120,0	5		326
SP 17	Signal and Image Processing	4,0	120,0	5		326
SP 18	Computer Game Technology Engineering	4,0	120,0	6		326
SP 19	Automatic Design Engineering	4,0	120,0	6		326
SP 20 SP 21	Computer Systems	4,0	120,0	/ 8		320
SP 22	Mobile Applications Design	4,0	120,0	8		320
SP 23	Fundamentals of Artificial Intelligence	4.0	120,0	8		326
2	Professional training	15.0	450.0	-		6 25%
- PT 1	Familiarization Practice at "Innovation Campus"	3.0	90.0		2	326
PT 2	Project (practice)*	6,0	180,0		6	326
PT 3	Pre-graduation Practice*	6,0	180,0		8	326
3	Attestation*	6,0	180,0			2,50%
4	Optional educational components	60.0	1800.0			25.00%
4.1	Profile training	32.0	960.0			53%
		02,0	000,0			
4.1.1	Profiled discipline package 01 "Programming of mobile devices and computer systems"	32,0	960,0			
OP1.1	Fundamentals of Computer Mathematics	4,0	120,0	3		326
OP1.2	Systems Theory and Systems Analysis	4,0	120,0		4	326
OP1.3	Web programming	4,0	120,0		5	326
OP1.4	Reverse Programming	4,0	120,0	6		326
OP1.5	NET Framework Software Technology	4,0	120,0	6	0.0	326
0P1.6	Poreign Language for Computer Systems Development	8,0	240,0	7	3-6	2/3
0P1.7	Parallel and Distributed Computing	4,0	120,0	/		326
OP2 1	Fromed discipline package 02 minovation campus	4 0	120.0	3		326
OP2.2	System Analysis	4.0	120,0	5	4	326
OP2.3	Fundamentals of Web Development	4,0	120.0		5	326
OP2.4	Cross-platform Technologies	4,0	120,0	6		326
OP2.5	Programms and Data Security Basics	4,0	120,0	6		326
OP2.6	Foreign Language for IT Project Management	8,0	240,0		3-6	273
OP2.7	Parallel and Cloud Computing Systems	4,0	120,0	7		326
4.2	Optional student disciplines of the profile preparation according to the list	16,0	480,0			27%
OPT 1	OPT 1	4,0	120,0		6	326
OPT 2	OPT 2	4,0	120,0		7	326
	OPT 3	4,0	120,0		7	326
0114		4,0	120,0		8	326
4.3	Educational components of the student's free choice from the university catalog	12,0	360,0			20%
a a .						
UD 1	OD 1	4,0	120,0		7	
		4,0	120,0		7	
003	Total for advection period	4,0	7200.0		'	
	rotarior education period	∠40,0	7200,0			

V. EDUCATION PROCESS PLAN

KH-924i.e

EPF		S di	Semest istributi	er on			1	Number	of hours	6			Dis	tributio	n of cla	ssroom	hours	per a	weel	k and	ECTS	6 cred	its pe	r a ser	neste	r		
the								Class	room				l co	urse			ll cou	rse			III co	ourse			IV co	ourse		
vith					its													Sem	est	ers								
é					red			i	ncluding	g			1		2	2	3	4	4		5		6	7	7		8	
anc	Name of academic discipline				s S				S	<i>(</i> 0	Ę		•		-	Ni	mhor	of wee	ake in	the s	omost	or	•				-	
ord				sks	Ω C				ork	diea	Ŵ		20		0	2		51 WEE	0	uie 3	20		0	2	0		0	
00				tas	Ũ	nu			Ň	stuc	ent		20		.0	2	0	2	.0	4	20	2	.0	2	0	4	.0	ut
ца				la	r o	om		S	tor	als	pde	0 v		8 %		8 %		o م		o م		o م		o م		o م		me
je j		ms	s	vidi	pe	ala	-	nre	ora	ctic	ede	Src	is: S	Src	its, co	Src	its. S	Src	is s	Src	s ≌	Src	s: s	Src	its S	Src	is: S	artı
õ		Exa	est	ipu	Inn	ota	ota	ect	ab	rac	nde	las ho	red	las ho	CT	las ho	red	las ho	red	las hc	red Ted	las hc	red red	las ho	CT	las ho	red	Jep
1	2	3	4	5	6	7	8	9	10	11	 12	13	шо 14	15	шо 16	17	<u>шо</u> 18	<u>0 E</u> 19	ш о 20	<u>0 E</u> 21	<u>ш</u> 22	23	шо 24	<u>∪</u> E 25	<u>ш</u> о 26	0 E 27	шо 28	29
1	Obligatory educational components	-	-		159.0	4770.0	2040.0	832.0	424.0	784.0	2730.0	25.0	30.0	25.0	27.0	19.0	24.0	19.0	24.0	19.0	24.0	8.0	10.0	5.0	6.0	17.0	14.0	
1.1	General training				62.0	1860.0	828.0	232.0	16.0	580.0	1032.0	16.0	19.0	20.0	22.0	5.0	6.0	6.0	7.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
GT 1	History and Culture of Ukraine	1		R	4.0	120.0	48.0	16.0	- / -	32.0	72.0	3.0	4.0	- / -	,-	- / -	- / -	- / -	,-	1-	1-	1-		1-	1-	,-	1-	310
GT 2	Foreign Language in Professional Field	2			3.0	90.0	28.0	,.		28.0	62.0	-,-	.,.	2.0	3.0													275
					- , -	100.0					00,0			_,=	0,0													
GT 3	Ukrainian Language (for professional purposes)		1,2		4,0	120,0	60,0			60,0	60,0	2,0	2,0	2,0	2,0													273
	Fundamentals of Humanitarian and																											
GT 4	Philosophical Knowledge in Professional	2		R	4,0	120,0	42,0	28,0		14,0	78,0			3,0	4,0													307
	Activity																											
GT 5	Physics	1		С	5,0	150,0	64,0	32,0	16,0	16,0	86,0	4,0	5,0															168
GT 6	Higher Mathematics p.1		1		6,0	180,0	80,0	32,0		48,0	100,0	5,0	6,0															324
GT 7	Higher Mathematics p.2	2			5,0	150,0	70,0	28,0		42,0	80,0			5,0	5,0													324
GT 8	Discrete Mathematics	2		С	6,0	180,0	84,0	32,0		52,0	96,0			6,0	6,0													326
GT 9	Probability Theory	3		С	4,0	120,0	48,0	32,0		16,0	72,0					3,0	4,0											326
GT 10	Computer Electronics	4		CG	5,0	150,0	64,0	32,0		32,0	86,0							4,0	5,0									326
GT 11	Foreign Language for Professional	8	7		40	120.0	52.0			52.0	68.0													20	20	20	20	273
	Communications	0	'		4,0	120,0	02,0			02,0	00,0													2,0	2,0	2,0	2,0	210
GT	Physical education		1 - 6		12,0	360,0	188,0			188,0	172,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0					302
1.2	Professional training				97,0	2910,0	1212,0	600,0	408,0	204,0	1698,0	9,0	11,0	5,0	5,0	14,0	18,0	13,0	17,0	17,0	22,0	6,0	8,0	3,0	4,0	15,0	12,0	
SP 1	Algebra for Programming	1			3,0	90,0	48,0	16,0		32,0	42,0	3,0	3,0															326
SP 2	Introduction to Specialty. Fundamentals of	1			3.0	90.0	32.0	16.0		16.0	58.0	2.0	3.0															326
	Computer Engineering				0,0	00,0	02,0	. 0,0		. 0,0	00,0	_,0	0,0															010
SP 3	Programming p.1	1			5,0	150,0	64,0	32,0	32,0		86,0	4,0	5,0															326
SP 4	Programming p.2	2			5,0	150,0	70,0	28,0	28,0	14,0	80,0			5,0	5,0													326
SP 5	Algorithms and Data Structures	3		-	5,0	150,0	64,0	32,0		32,0	86,0					4,0	5,0											326
SP 6	Database Organization and Design	3		C	4,0	120,0	48,0	32,0	16,0		72,0					3,0	4,0											326
SP 7	Computer Architecture	3	_	CP	5,0	150,0	64,0	32,0	32,0		86,0					4,0	5,0											326
SP 8	Object-oriented Programming p.1		3		4,0	120,0	48,0	32,0	16,0		72,0					3,0	4,0	0.0	1.0									326
SP 9	Object-oriented Programming p.2	4		0.0	4,0	120,0	48,0	32,0	16,0	40.0	72,0							3,0	4,0									326
5P 10	System Programming	4		CP	5,0	150,0	64,0	32,0	16,0	16,0	86,0							4,0	5,0									326
	Computer Graphics	4	4		4,0	120,0	48,0	10,0	32,0		72,0							3,0	4,0									326
	Database Development and Application	4			4,0	120,0	48,0	32,0	16,0	16.0	72,0							3,0	4,0	4.0	FO							326
2014	System Sollware	2 F			5,0	120,0	48.0	32,U	16.0	16,0	72.0									4,0	3,0							320
D 15	Computer Circuitry	5		CD	4,0	120,0	40,0	22.0	22.0	10,0	72,0									3,0	4,0							320
0 10		0	1		5,0	100,0	04,0	J∠,U	J∠,U		00,0			1						1 4 ,U	1,0,0	1		1				J ∠ 0

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
SP 16	Microprocessors Architecture and Programming	5		С	4,0	120,0	48,0	16,0	16,0	16,0	72,0									3,0	4,0							326
SP 17	Signal and Image Processing	5			4,0	120,0	48,0	32,0		16,0	72,0									3,0	4,0							326
SP 18	Computer Game Technology Engineering	6			4,0	120,0	48,0	16,0	32,0		72,0											3,0	4,0					326
SP 19	Automatic Design Engineering	6			4,0	120,0	48,0	32,0	16,0		72,0											3,0	4,0					326
SP 20	Computer Systems	7			4,0	120,0	48,0	32,0	16,0		72,0													3,0	4,0			326
SP 21	Formal Languages, Grammar, and Automata	8			4,0	120,0	50,0	20,0		30,0	70,0															5,0	4,0	326
SP 22	Mobile Applications Design	8			4,0	120,0	50,0	20,0	30,0		70,0															5,0	4,0	326
SP 23	Fundamentals of Artificial Intelligence	8		С	4,0	120,0	50,0	20,0	30,0		70,0															5,0	4,0	326
2	Professional training				15,0	450,0					450,0				3,0								6,0				6,0	
PT 1	Familiarization Practice at "Innovation Campus"		2		3,0	90,0					90,0				3,0													326
PT 2	Project (practice)*		6		6,0	180,0					180,0												6,0					326
PT 3	Pre-graduation Practice*		8		6,0	180,0					180,0																6,0	326
3	Attestation*				6,0	180,0					180,0																6,0	
4	Optional educational components				60,0	1800,0	754,0	208,0	192,0	160,0	1046,0					5,0	6,0	5,0	6,0	5,0	6,0	11,0	14,0	18,0	24,0	5,0	4,0	
4.1	Profile training				32,0	960,0	416,0	144,0	112,0	160,0	544,0					5,0	6,0	5,0	6,0	5,0	6,0	8,0	10,0	3,0	4,0			
4.1.1	Profiled discipline package 01 "Programming of mobile devices and computer systems"				32,0	960,0	416,0	144,0	112,0	160,0	544,0					5,0	6,0	5,0	6,0	5,0	6,0	8,0	10,0	3,0	4,0			
OP1.1	Fundamentals of Computer Mathematics	3		С	4,0	120,0	48,0	16,0	32,0		72,0					3,0	4,0											326
OP1.2	Systems Theory and Systems Analysis		4		4,0	120,0	48,0	32,0		16,0	72,0							3,0	4,0									326
OP1.3	Web programming		5		4,0	120,0	48,0	32,0	16,0		72,0									3,0	4,0							326
OP1.4	Reverse Programming	6			4,0	120,0	48,0	32,0	16,0		72,0											3,0	4,0					326
OP1.5	.NET Framework Software Technology	6			4,0	120,0	48,0	16,0	32,0		72,0											3,0	4,0					326
OP1.6	Foreign Language for Computer Systems Development		3-6		8,0	240,0	128,0			128,0	112,0					2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0					273
OP1.7	Parallel and Distributed Computing	7			4,0	120,0	48,0	16,0	16,0	16,0	72,0													3,0	4,0			326
4.1.2	Profiled discipline package 02 "Innovation Campus"				32,0	960,0	416,0	128,0	112,0	176,0	544,0					5,0	6,0	5,0	6,0	5,0	6,0	8,0	10,0	3,0	4,0			
OP2.1	Fundamentals of Computer Modeling	3		С	4,0	120,0	48,0	16,0	32,0		72,0					3,0	4,0											326
OP2.2	System Analysis		4		4,0	120,0	48,0	32,0		16,0	72,0							3,0	4,0									326
OP2.3	Fundamentals of Web Development		5		4,0	120,0	48,0	32,0	16,0		72,0									3,0	4,0							326
OP2.4	Cross-platform Technologies	6			4,0	120,0	48,0	16,0	32,0		72,0											3,0	4,0					326
OP2.5	Programms and Data Security Basics	6			4,0	120,0	48,0	16,0	32,0		72,0											3,0	4,0					326
OP2.6	Foreign Language for IT Project Management		3-6		8,0	240,0	128,0			128,0	112,0					2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0					273
OP2.7	Parallel and Cloud Computing Systems	7			4,0	120,0	48,0	16,0	1	32,0	72,0		1											3,0	4,0			326

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
4.2	Optional student disciplines of the profile preparation according to the list				16,0	480,0	194,0				286,0											3,0	4,0	6,0	8,0	5,0	4,0	
OPT 1	OPT 1		6	С	4,0	120,0	48,0	32,0	16,0		72,0											3,0	4,0					326
OPT 2	OPT 2		7		4,0	120,0	48,0	32,0		16,0	72,0													3,0	4,0			326
OPT 3	OPT 3		7	С	4,0	120,0	48,0	32,0		16,0	72,0													3,0	4,0			326
OPT 4	OPT 4		8		4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0	326
4.3	Educational components of the student's free choice from the university catalog				12,0	360,0	144,0	64,0	80,0		216,0													9,0	12,0			
OD 1	OD 1		7		4,0	120,0	48,0	16,0	32,0		72,0													3,0	4,0			
OD 2	OD 2		7		4,0	120,0	48,0	16,0	32,0		72,0													3,0	4,0			
OD 3	OD 3		7		4,0	120,0	48,0	32,0	16,0		72,0													3,0	4,0			
	Total for education period				240,0	7200,0	2794,0	1040,0	616,0	944,0	4406,0	25,0	30,0	25,0	30,0	24,0	30,0	24,0	30,0	24,0	30,0	19,0	30,0	23,0	30,0	22,0	30,0	
	Hours per week											25	5,0	2	5,0	24	4,0	24	4,0	24	4,0	19	9,0	23	3,0	22	2,0	
	Number of exams											5	5		5	4	5	4	4	ł	5	4	1	12	2		4	
	Number of tests		_									3	3		3		3	4	4		3	4	1	6	6		3	
	Number of course projects (works)		_														1	1	1		1	_						
	Numbers of disciplines per semester											8	8		8		8	8	3	8	8	8	3	8	3		7	

Individual tasks
Calculated task
Calculated and graphic task
Report
Course project
V Course work

Approved by the Academic Council of NTU "KhPI" Protocol №6 from 05.07.2024

Vice-rector of Scientific-and-Pedagogical Work

Hennadii KHRYPUNOV

Director of the Educational and Scientific Institute of Computer Sciences and Information Technologies

1 Mykhailo GODLEVSKY signature

Head of the educational program "Modern programming, mobile devices and computer games"

Head of the Department "Computer Engineering and Programming" Institute's department name

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List of optional student disciplines of the profile training

EPP		S di:	emest stributi	er on				Number	of hour	s			Di	istributi	on of cl	assroo	n hour	s per a	a wee	k and	ECTS	6 credi	its per	a sei	meste	r		
the								Class	sroom				l co	urse			II cou	rse			III co	urse			IV c	ourse		ĺ
it					its													Sem	est	ers								ĺ
≥ ⊕					red			i	ncludin	g			1		2	:	3	4	1	1	5	6	i i	7	7		8	ĺ
anc	Name of academic discipline				s				S	(0	¥		-	1		N	umber	of wee	eks in	the s	emest	er		-			-	ĺ
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4.2	Optional student disciplines of the profile training																											
	Analytic struct and Dramming of																											
OPT 1	Microcontrollers		6	С	4,0	120,0	48,0	32,0	16,0		72,0											3,0	4,0					326
OPT 1	Embedded Systems		6	С	4,0	120,0	48,0	32,0	16,0		72,0											3,0	4,0					326
OPT 1	Architecture and Programming of Embedded Systems		6	С	4,0	120,0	48,0	32,0	16,0		72,0											3,0	4,0					326
OPT 2	Computer Games Architecture		7		4,0	120,0	48,0	32,0		16,0	72,0													3,0	4,0			326
OPT 2	Big Data Analysis		7		4,0	120,0	48,0	32,0		16,0	72,0													3,0	4,0			326
OPT 2	Information Security Management		7		4,0	120,0	48,0	32,0		16,0	72,0													3,0	4,0			326
OPT 3	Information and Encoding Theory		7	С	4,0	120,0	48,0	32,0		16,0	72,0													3,0	4,0			326
OPT 3	Hardware Information Security		7	С	4,0	120,0	48,0	32,0		16,0	72,0													3,0	4,0			326
OPT 3	Software Information Security		7	С	4,0	120,0	48,0	32,0		16,0	72,0													3,0	4,0			326
OPT 4	Software Testing		8		4,0	120,0	50,0	20,0		30,0	70,0															5,0	4,0	326
OPT 4	Risk-Oriented Analysis in Computer Engineering		8		4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0	326
OPT 4	Applied Cryptology		8		4,0	120,0	50,0	30,0		20,0	70,0															5,0	4,0	326