

MODULE HANDBOOK

BIG DATA ANALYSIS

BACHELOR PROGRAMME

2023

Astana IT University, 2023

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Module name:	Foreign Lang	guage 1: E	nglish f	for Aca	demic	Purpo	ses			
Code	IYa 1103									
Trimester	1									
Person	Group of instructors									
responsible	r									
for the module										
Lecturer(s)	A.Ayazbayeva, A.Urazbekova, A.Seidin, Y. Verba, S.Burbekova, N.Ishmukhambetov, K. Hassenov, A.Bakenova, M.Zhenisbayeva, F. Omarova, T.Almas, A. Salkenova, A.Rahimzhanova, S. Zhalmagambetova, A. Musina, M.Smagulova, M. Abzhaparova, M. Amanzhol, A. Smagulova, A. Ichshanova, A.Ormanova									
Language	English									
Relation to	Bachelor pro	grammes	:							
curriculum	6B06101 Con	puter Scie	ence							
	6B06102 Soft	ware Engi	neering							
	6B06103 Big	Data Anal	ysis							
	0B0410111 N	Tanageme	nı							
Type of	Practice sess	ions (sem	inars) a	are acti	ve ses	ssions t	to develop	stuc	dent's confidence	
teaching	through new e	xamples a	ind discu	issions	on the	proble	ms.			
	Instructor-su	pervised	indepen	dent st	tudy (ISIS) d	eals with re	viev	w and exploration	
	in greater dep	h of the c	ourse ma	aterial.	7 10 4	1	· 1 1·	.1	·· · · · · · · · · · · · · · · · · · ·	
	Student's inc	ependent	study ((818): 3	Self-st	udy tim	e including	the	e time required to	
Workload of	prepare for an	u complet	e all cou		essinei	ns.				
course	FCTS	Con	tact hour	rc	ISIS	SIS	Total hour	rs		
components	credits	Lecture	Practi	ce			1 Otal HOU	15		
and credits per		S	sessio	ns						
trimester	5		5	0	10	90	150			
Course										
assessment and	Period	Assess	sment	Numł	ber	Exam	Form	Sc	chedule	
forms of		type		of poi	ints			()	Week #)	
examination	1 st	Presen	tation	10		Oral d	efense	2 ⁿ	^d week	
	attestation	about a	an IT							
		invent	ion							
								1		

Module Handbook BDA 1st term

		Literature review (5+ sources)	10	Oral defense	4th week		
		Quiz 1 (Textbook + APA)	10	Computer based	5 th week		
		1 st attestation total	30				
	2nd attestation		Facts and10Opinionsabout an ITinventionusing APAin-textcitations		6 th week		
		Infomercials about an IT invention	10	Class demonstration with giving peer- feedback	8 th week		
		Quiz 2 (Textbook + APA)	10 Computer based		10 th week		
		2 nd attestation total	30				
	Final Exam: 1 "My invention	Presentation n"	40	TBA	During final exam session		
	Cumulative to	tal for the course	$e = 0,3 * 1^{st}$	$Att + 0.3 * 2^{nd} Att +$	0,4*Final = 100.		
Requirements according to the examination regulations	Course and un Attendance is grade (or sum Late submission No cheating, of Contacting the meetings with	niversity polic mandatory. Notes that the mandatory of the manual sectors of the manual sectors are not according to the manual sectors of the manual sect	epted. Isification of udents are w ring office h	: 6 of lessons will r of data, plagiarism velcome to arrange ours to discuss the	result in F (Fail) m, and crib e one-to-one e class.		
Recommended prerequisites	General Englis	h					
Module objectives/inte nded learning outcomes	 By the end of this course students will attain the following learning outcomes. The student will show a working knowledge in: reading and analyzing the structure and content of primary research articles evaluating the accuracy and reliability of various sources listening and understanding speaker viewpoints and extension of agreement, both implicit and explicit listening and analyzing types of supporting evidence: examples, definitions, and explanations 						

	• using persuasive language and evidence-based claims to deliver compelling							
	speeches							
	thinking questions							
	Students will have the skill to:							
	• apply critical thinking skills to identify bias in academic texts							
	• take notes from aural input for further study purposes							
	• ask and respond with appropriate syntax and vocabulary to open-ended higher- order thinking questions							
	• interact with peers to give and receive constructive feedback							
	• collect, analyze, and synthesize information from multiple academic sources							
	• write quotations, paraphrases and summaries using APA 7 th edition citation							
	style							
	In terms of competences, students will be able to							
	• recognize and critically evaluate a range of authentic academic texts							
	• understand and interpret explicit and implicit messages in lectures,							
	presentations, and interviews							
	• communicate fluently and accurately in academic discussions							
	• actively engage in formal discussions using complex sentence structures							
	draft and provide academic oral presentations							
	• acknowledge, paraphrase, quote sources in APA citation style, 7th edition							
	• use formal and informal language registers in an extended speech							
	develop public speaking skills							
	enhance self and peer assessment skills							
Content	The course emphasizes active and participatory learning through assignments that require students use their growing academic English skills and critical thinking skills during and outside class hours. The students will enhance their public speaking skills by engaging in increasingly advanced exercises in delivering oral presentations, both spontaneous and prepared. The course This Syllabus is developed in accordance with the aims and learning outcomes of the BA degrees in Computer Science, Software Engineering, Big Data Analysis, Media Technologies, Mathematical and Computational Science, Cyber Security, Smart Technologies, Digital Journalism, IT Management, IT Entrepreneurship, Digital Public Administration and Services, Industrial Internet of Thing, so that the students can successfully apply their knowledge and skills gained in the course in other subjects, demonstrate their academic English language competence, and successfully accomplish the Astana IT University coursework assignments.							
Media	Multimedia classrooms equipped with computer, projection and audio system:							
employed	Whiteboard; Microsoft Teams; LMS Moodle.							
Reading list	Main literature: De Chazal, E., & McCarter, S. (2015). Oxford EAP. A Course in English for Academic Purposes. Upper-intermediate / B2. The textbook is on Moodle/Microsoft Teams. The audio and video materials are available at <u>https://elt.oup.com/student/oxfordeap/b2?cc=kz&selLanguage=en</u> <u>oxfordlearnersbookshelf.com</u> Oxford EAP B2 - 270785388838 <i>Recommended literature:</i> Coursers course: Speaking so that people listen							
	Language instructors will weekly post additional sources such as readings							
	PowerPoint presentations, and website links on Moodle							

Module name:	History of Kazakhstan
Code	
Trimester	1, 2, 3

responsible	Assoc. Prof. N. Shayakhmet									
for the module										
Lecturer(s)	Assoc. Prof. S	S. Mamytov	/a							
	Assoc. Prof. 2	Assoc. Prof. Zh. Zhampeissova								
	Assoc. Prof. A	A. Auzhano	ova							
	Assoc. Prof. 1	Assoc. Prof. K. Battalov								
Language	English									
Relation to	Bachelor programmes: all specialties									
curriculum										
Type of teaching	The lectures serve to introduce students to the theoretical and methodological basis									
	of the course and new concepts on the history of Kazakhstan.									
	analysis in th	ons are and	vents process	ng the s	kills 0 honor	n ana	alytical and	a axiological		
	Kazakhstan	c study of c	vents, processe	ls and p	nenon	icna		01 y 01		
	Instructor-sur	pervised ind	lependent study	v (ISIS)	involv	ves a	a deeper sti	idy of course		
	materials.		epenaene staa.	, (1010)	mitori		a deeper se	ady of course		
	Student's ind	ependent st	udy (SIS): self	-study t	ime, in	nclu	ding the tin	ne required to		
	prepare and c	omplete all	course assignt	nents.			C	*		
Workload of										
course	ECTS	Cont	act hours	ISIS	SIS	To	otal hours			
components and	credits	Lecture	Practice							
credits per		S	sessions							
trimester	5	20	30	10	90		150			
Course										
assessment and	Period		Assignmen	its			Number o	of Total		
forms of	I CHOU		rissignmen	105			points	i iotai		
examination	1 st	- Listenin	g to the lecture	s and			P 0 0 0	100		
	mination I st - Listening to the fectures and							100		
	attestation	answering	the test tasks	- 4 poin	ts (1-5		20	100		
	attestation	answering weeks=20	g the test tasks -	- 4 poin	ts (1-5		20	100		
	attestation	answering weeks=20 - Activity	g the test tasks) on seminar ses	- 4 poin ssions 1	ts (1-5		20 10	100		
	attestation	answering weeks=20 - Activity -Activity	the test tasks on seminar ses	- 4 poin ssions 1 sions 2	ts (1-5		20 10 10	100		
	attestation	answering weeks=20 - Activity -Activity	the test tasks on seminar ses on seminar ses	- 4 poin ssions 1 sions 2 sions 3	ts (1-5		20 10 10 10	100		
	attestation	answering weeks=20 - Activity -Activity -Activity	g the test tasks on seminar ses on seminar ses on seminar ses on seminar ses	- 4 poin ssions 1 sions 2 sions 3 sions 4	ts (1-5	6	20 10 10 10 10	100		
	attestation	answering weeks=20 - Activity -Activity -Activity Mid Tern	the test tasks on seminar session seminar setting (- 4 poin ssions 1 sions 2 sions 3 sions 4 and defe	ts (1-5 ense of	f	20 10 10 10 10 40	100		
	attestation	answering weeks=20 - Activity -Activity -Activity Mid Tern the media	the test tasks on seminar sess on seminar sess on seminar sess on seminar sess on seminar sess on seminar sess the preparation of presentation (1	- 4 poin ssions 1 sions 2 sions 3 sions 4 and defe	ts (1-5	f	20 10 10 10 10 40	100		
	attestation	answering weeks=20 - Activity -Activity -Activity Mid Tern the media project) on - 40 %	g the test tasks on seminar sess on seminar sess on seminar sess on seminar sess on seminar sess on seminar sess n: preparation a presentation (1 n a chosen topi	- 4 poin ssions 1 sions 2 sions 3 sions 4 and defe research ic (1-5 v	ts (1-5 ense of veeks)	f	20 10 10 10 10 40	100		
	attestation	answering weeks=20 - Activity -Activity -Activity -Activity Mid Tern the media project) of - 40 % Attendance	g the test tasks on seminar session for presentation (in a chosen topi ce – at least 70°	- 4 poin ssions 1 sions 2 sions 3 sions 4 and defe research c (1-5 v	ense of veeks)	f	20 10 10 10 10 40	100		
	attestation	answering weeks=20 - Activity -Activity -Activity Mid Tern the media project) of - 40 % Attendance	the test tasks on seminar session (not seminar session (not seminar set) (not set) and the set (not set) (n	- 4 poin ssions 1 sions 2 sions 3 sions 4 and deforesearch to (1-5 w % s and	ts (1-5	f	20 10 10 10 10 40	100		
	attestation ^{2nd} attestation	answering weeks=20 - Activity -Activity -Activity Mid Tern the media project) of - 40 % Attendance - Listening answering	(b) the test tasks on seminar session seminar set	- 4 poin ssions 1 sions 2 sions 3 sions 4 and deforesearch c (1-5 v) $\frac{2}{5}$ s and - 4 poin	ts (1-5 ense of veeks) ts (6-1	f 0	20 10 10 10 10 40 20	100		
	attestation ^{2nd} attestation	answering weeks=20 - Activity -Activity -Activity Mid Tern the media project) of - 40 % Attendance - Listening answering weeks=20	(i) the test tasks on seminar session (i) presentation (i) a chosen topic set at least 709 g to the lecture g to the lecture g the test tasks (i)	- 4 poin ssions 1 sions 2 sions 3 sions 4 and deforesearch te (1-5 w $\frac{2}{3}$ s and - 4 poin	ts (1-5 ense of veeks) ts (6-1	f 0	20 10 10 10 10 40 20	100		
	attestation 2 nd attestation	answering weeks=20 - Activity -Activity -Activity Mid Tern the media project) of - 40 % Attendance - Listening answering weeks=20 - Activity	(i) the test tasks on seminar session repeatation (ran a chosen topic ce – at least 700 g to the lecture g the test tasks (rank) on seminar session seminar set	- 4 poin ssions 1 sions 2 sions 3 sions 4 and deforesearch te (1-5 v <u>%</u> s and - 4 poin	ts (1-5 ense of veeks) ts (6-1	f 0	20 10 10 10 40 20 10	100		
	attestation ^{2nd} attestation	answering weeks=20 - Activity -Activity -Activity Mid Tern the media project) on - 40 % Attendance - Listening answering weeks=20 - Activity	(i) the test tasks on seminar session seminar session seminar session seminar session seminar session seminar session repeatation (i) presentation (i) n a chosen topi $\frac{e}{2}$ at least 709 g to the lecture the test tasks on seminar session seminar sets sets tasks s	- 4 poin ssions 1 sions 2 sions 3 sions 4 and deforesearch c (1-5 v) s and - 4 poin ssions 6 sions 7	ts (1-5 ense of veeks) ts (6-1	f 0	20 10 10 10 40 20 10 10 10	100		
	attestation 2 nd attestation	answering weeks=20 - Activity -Activity -Activity -Activity Mid Tern the media project) of - 40 % Attendance - Listening answering weeks=20 - Activity - Activity - Activity	(i) the test tasks on seminar session (non a chosen topic ce – at least 700 g to the lecture (the test tasks for the seminar session seminar set	- 4 poin ssions 1 sions 2 sions 3 sions 4 and deferesearch c (1-5 v) $\frac{\sqrt{6}}{s and}$ - 4 poin ssions 6 sions 7 sions 8	ts (1-5 ense of veeks) ts (6-1	f 0	20 10 10 10 10 40 20 10 10 10 10 10 10 10 10 10 1	100		
	attestation ^{2nd} attestation	answering weeks=20 - Activity -Activity -Activity Mid Tern the media project) of - 40 % Attendance - Listening answering weeks=20 - Activity - Activity - Activity	(i) the test tasks on seminar session a chosen topic ce – at least 700 g to the lecture g the test tasks (i) on seminar session seminar set	- 4 poin ssions 1 sions 2 sions 3 sions 4 and defe research tc (1-5 v <u>%</u> s and - 4 poin ssions 6 sions 7 sions 8 sions 9	ts (1-5 veeks) ts (6-1	f 0	20 10 10 10 40 20 10 10 10 10 10 10 10 10 10 1	100		
	attestation 2 nd attestation	answering weeks=20 - Activity -Activity -Activity -Activity Mid Tern the media project) on - 40 % Attendance - Listening answering weeks=20 - Activity - Activity - Activity - Activity - Activity - Activity	(i) the test tasks on seminar session seminar session seminar session seminar session seminar session seminar session repeatation (i) a chosen topi $\frac{e}{2} - \frac{at least 709}{2}$ to the lecture to the test tasks (i) on seminar session seminar sesion seminar session seminar session seminar session sem	- 4 poin ssions 1 sions 2 sions 3 sions 4 and deferesearch c (1-5 v) s and - 4 poin ssions 6 sions 7 sions 8 sions 9 and deferesearch	ense of veeks) ts (6-1	f 0 f	20 10 10 10 10 40 20 10 10 10 10 10 40	100		
	attestation 2 nd attestation	answering weeks=20 - Activity -Activity -Activity Mid Tern the media project) of - 40 % Attendance - Listening weeks=20 - Activity -Activity -Activity -Activity -Activity -Activity -Activity	(i) the test tasks on seminar session a chosen topic $\frac{xe - at least 709}{g to the lecture}$ on seminar session seminar sess	- 4 poin ssions 1 sions 2 sions 3 sions 4 and deferesearch c (1-5 v) $\frac{\sqrt{6}}{s}$ s and - 4 poin ssions 6 sions 7 sions 8 sions 9 and deferesearch	ense of veeks) ts (6-1	f 0 f	20 10 10 10 10 40 20 10 10 10 10 10 40 40	100		
	attestation 2 nd attestation	answering weeks=20 - Activity -Activity -Activity Mid Tern the media project) of - 40 % Attendance - Listening answering weeks=20 - Activity -	(i) the test tasks on seminar session seminar session seminar session seminar session seminar session seminar session repeatation (ran a chosen topi ce – at least 700 g to the lecture g the test tasks (rank) on seminar session seminar set	- 4 poin ssions 1 sions 2 sions 3 sions 4 and deferesearch ic (1-5 v $\frac{2}{3}$ s and - 4 poin ssions 6 sions 7 sions 8 sions 9 and deferesearch ic (6-10	ts (1-5 veeks) ts (6-1 weeks	f 0 f \$)	20 10 10 10 40 20 10 10 10 10 10 10 40	100		
	attestation 2 nd attestation	answering weeks=20 - Activity -Activity -Activity Mid Tern the media project) on - 40 % Attendance - Listening answering weeks=20 - Activity -Activity 	(i) the test tasks on seminar session seminar session seminar session seminar session seminar session seminar session repeatation (in a chosen topic ce – at least 709 g to the lecture (the test tasks – (the te	- 4 poin ssions 1 sions 2 sions 3 sions 4 and deferesearch c (1-5 v) s and - 4 poin ssions 6 sions 7 sions 8 sions 9 and deferesearch c (6-10)	ts (1-5 veeks) ts (6-1 weeks	f 0 f \$)	20 10 10 10 10 40 20 10 10 10 10 10 40	100		
	attestation 2 nd attestation Final	answering weeks=20 - Activity -Activity -Activity Mid Tern the media project) of - 40 % Attendance - Listening answering weeks=20 - Activity - Activity - Activity - Activity - Activity End Tern the media project) of - 40 % Attendance State exam	(in a chosen topic on seminar session seminar session seminar session seminar session seminar session seminar session repeatation (non a chosen topic ce - at least 700 g to the lecture g to the lecture g to the lecture g to the lecture g the test tasks (i) on seminar session seminar set (presentation (presenta	- 4 poin ssions 1 sions 2 sions 3 sions 4 and deferesearch c (1-5 v $\frac{2}{3}$ s and - 4 poin ssions 6 sions 7 sions 8 sions 9 and deferesearch c (6-10 $\frac{2}{3}$	ts (1-5 ense of veeks) ts (6-1 ense of weeks	f 0 f t)	20 10 10 10 10 40 20 10 10 10 10 10 10 40	100		
	attestation 2 nd attestation Final exam*	answering weeks=20 - Activity -Activity -Activity Mid Tern the media project) of - 40 % Attendance - Listening answering weeks=20 - Activity -Acti	(i) the test tasks on seminar session seminar session seminar session seminar session seminar session seminar session repeatation (a chosen topic g to the lecture (b) on seminar session sem	- 4 poin ssions 1 sions 2 sions 3 sions 4 and deferesearch c (1-5 v) s and - 4 poin ssions 6 sions 7 sions 8 sions 9 and deferesearch c (6-10) where the constant of the state of the state and deferes a state of the state	ense of veeks) ts (6-1 weeks ice tes	f 0 f t)	20 10 10 10 40 20 10 10 10 10 10 10 40	100		

Requirements	Course and university policies include:
according to the	Attendance is mandatory Missing 30% of lessons will result in F (Fail)
examination	grade (or summer school)
regulations	
regulations	Late submissions are not accepted.
	No cheating, duplication, falsification of data, plagiarism, and crib
	Contacting the Lecturer : students are welcome to arrange one-to-one
	meetings with the teacher during office hours to discuss the class.
	6 6
Recommended	World History, Geography
prerequisites	
Module	By the end of this course students will attain the following learning outcomes.
objectives/inten	The student will show a working knowledge in:
ded learning	- Know and understand the main stages in the development of the history of
outcomes	Kazakhstan;
	- Correlation of the phenomena and events of the historical past with the general
	paradigm of the world-historical development of human society through critical
	analysis.
	Students will have the skill to
	- have the skills of analytical and axiological analysis in the study of historical
	processes and phenomena of modern Kazakhstan:
	be able to objectively and comprehensively comprehend the immanent features of
	the modern Vezelth model of developments
	In terms of Competences, students will be able
	to systematize and give a critical assessment of historical phenomeno and
	- to systematize and give a critical assessment of historical phenomena and
Cantant	The service of the first of the service of the serv
Content	The course content consists of 5 thematic blocks: ancient people and the formation of
	a nomadic civilization, Turkic civilization and the Great Steppe, Kazakhstan in
	modern times (XVIII - early XX centuries), Kazakhstan in the Soviet period,
	Independent Kazakhstan.
Media	Multimedia classrooms equipped with computer, and projection; Microsoft Teams;
employed	LMS Moodle.
Reading list	Basic Literature:
	1.History of Kazakhstan (Қазақ Елі): A 4-volume set of textbooks. Books 1-4 /
	T.Omarbekov, B.Karibaev, N.Nurtazina [et al.].– Almaty: Qazaq University, 2021
	2.Исмагулов О., Исмагулова А. Происхождение казахского народа. По данным
	физической антропологии. Алматы, 2017. – 196 с.
	3. Кәрібаев Б.Б. Қазақ хандығының құрылу тарихы. – Алматы: «Сардар» баспа
	үйі, 2014. – 520 б.
	Supplementary literature:
	1.Formation and development of present statehood of Kazakhstan. Foundation of the
	First President of the Republic of Kazakhstan – Elbasy. Nur-Sultan, 2019
	2. <u>Yuval Noah Harari</u> (2014), Sapiens: A Brief History of Humankind.
	3. M. Olcott (1996), The Kazakhs, The Stanford University.

Module name:	Linear Algebra
Code	
Trimester	1 for Sofware Engineering, Big Data Analysis, Computer Science, IT Management
Person responsible	Assoc. Prof. M. Sergaziyev, PhD
for the module	
Lecturer(s)	Syndar Satbayev
	M. Sergaziyev
Language	English

Relation to Bachelor programms: Media Technology, 11,									
curriculum Compulsory course.	Compulsory course.								
Type of teaching Lectures serve to introduce new concepts and provide theoretical and methodol	Lectures serve to introduce new concepts and provide theoretical and methodological								
foundations.	foundations.								
Practice sessions (seminars) are active sessions to develop student's contraction of the problems	Practice sessions (seminars) are active sessions to develop student's confidence								
Instructor supervised independent study (ISIS) deals with review and evals	through new examples and discussions on the problems.								
in greater denth of the course material	Instructor-supervised independent study (ISIS) deals with review and exploration								
Student's independent study (SIS): Self-study time including the time requi	In greater depth of the course material. Student's independent study (SIS): Self-study time including the time required to								
prepare for and complete all course assessments.	prepare for and complete all course assessments.								
Workload of	prepare for and complete an course assessments.								
course ECTS Contact hours ISIS SIS Total hours									
components and credits Lecture Practice									
credits per s sessions									
trimester 5 30 20 10 90 150									
Course									
assessment and Period Assessment Number Exam Form Schedule									
forms of type of points (Week #)									
examination 1 st Problem Sets 30 Submission of Weekly									
attestation written reports									
Quiz 30 Written 3 rd week									
Mid-term Exam 40 Written 5 th week									
1 st attestation 100									
total									
2ndProblem Sets30Submission ofWeekly									
attestation written reports									
Quiz30Written8th week									
End-term Exam 40 Written 10 th week									
2 nd attestation 100									
total									
Final Exam 100 Written During final									
exam session	1								
Cumulative total for the course = $0.3 \times 1^{\text{st}}$ Att + $0.3 \times 2^{\text{nd}}$ Att + $0.4 \times 1^{\text{st}}$ Final = 1	00.								
Requirements The offline final exam for the course "Linear Algebra" includes theoretical and	l								
according to the practical tasks for 80 minutes. The online final exam for the course "Linear									
examination Algebra" includes twenty theoretical and practical multiple-choice tasks for 80									
regulations minutes. Students will be given multichoice tasks in LMS and must give their									
answers by choosing one variant. At the completion of the exam, all works mu	st be								
submitted in the Learning Management System (moodle.astanait.edu.kz). No l	ite								
submissions are allowed in the exam									
Recommended Linear Algebra, Calculus I, Calculus II, Discrete mathematics.									
prerequisites									
Module									
objectives/inten By the end of this course students will attain the following learning outcomes.									
ded learning I he student will show a working knowledge in:									
outcomes - 10 demonstrate knowledge of mathematical knowledge									
- 10 understand basic mainematical principles (proving, counting)	- To understand basic mathematical principles (proving, counting)								
- To understand fundamental properties of matrices including determinants in	- To understand fundamental properties of matrices including determinants inverse								

	matrices, matrix factorizations, eigenvalues, and linear transformations. Solve							
	systems of linear equations.							
	- To develop mathematical abilities in writing programs by computers.							
	Students will have the skill to							
	- Ability to write mathematical statements and problem solutions using mathematical							
	symbols.							
	- Understanding of key mathematical concepts and the application of appropriate							
	- Writir	ng logical progression	ns of precise mathematical statements to justify and					
	- writing logical progressions of precise mathematical statements to justify and communicate your reasoning.							
	In term	s of Competences, st	tudents will be able to:					
	1) under	rstand types of solution	ons of systems of linear equations and present them in					
	differen	t forms						
	2) comp	oute the inverse of a m	natrix					
	3) be at	ole to construct the ma	atrix of a linear transformation in given basis					
	4) deter	mine the dimension of	f a subspace and the rank of a matrix					
	5) comp	oute determinants						
	6 know	how to find null space	ces and column spaces of matrices					
	(7) know	how to find eigenval	ues and corresponding eigenvectors					
	8) perfo	rm the diagonalization	n of a matrix					
Content	#	Abbreviation	Meaning					
		ISIS	Instructor-supervised independent work					
	2	SIS	Students' independent work					
	3	IP	Individual project					
	4	PA	Practical assignment					
	5	LW	Laboratory work					
	6	MCQ	Multiple choice quiz					
Media	Multime	edia classrooms equip	ped with computer, projection and audio system;					
employed	Whitebo	oard; Microsoft Teams	s; LMS Moodle.					
D 11 11								
Reading list	Assigne	d reading materials a	and presentations should be read prior to class. Class					
	lectures	and discussions will j	proceed with supplemental and advanced topics, which					
	Could be	e difficult to underst	and unless students have read the assigned material.					
	the co	s are listed in the sche	flected in the Learning Management System					
	(moodle	vastanait edu kz)	nected in the Learning Management System					
	(inooure	.astallalt.edu.kz).						
	Basic Li	iterature:						
	1. Lectu	re presentations						
	2. Davi	d C. Lay, Steven R.	Lay and Judi J. McDonald, Linear Algebra and Its					
	Applica	tions, 5th edition, 201	6					
	3. Geor	ge B. Thomas and R	coss L. Finney, Calculus and Analytic Geometry, 9th					
	Edition,	1998						
	Supplen	nentary literature:						
	1. Introd	luction to linear Algel	bra. Gilbert Strang					
	2. Linea	r Algebra and Its App	olications, by Gilbert Strang, 4th Edition					
	3. Bekl	emishev D.V. The C	Course in Analytical Geometry and Linear Algebra.					
	Moscow: Nauka, 2012.							

Module name:	Information Communication Technologies
Code	
Trimester	1
Person	Senior lecturer E. Aitmukhanbetova, M.Sc.

responsible for the module										
Lecturer(s)	Zh.Sarsenova, M.Sc. M.Yermaganbetova, PhD									
Language	English	000000,1111	<i>,</i>							
Relation to	Bachelor pro	Bachelor programmes: Big Data Analysis, Software Engineering, IT Management								
curriculum	Compulsory course.									
Type of teaching	Lectures serve to introduce new concepts and provide theoretical and methodological foundations.									
	Practice ses	sions are	active s	sessions	s to d	evelop	student's	confidence through		
	discussions o	n the proble	ems.	-land of	J (I	eter da	- 1			
	Instructor-su	apervised i	naepen	dent st atorial	uay (1	515) ae	als with rev	new and exploration		
	Student's in)th of the or denendent	etudy (ateriai.	elf_stu	dy time	including	the time required to		
	prepare for a	nd complete	∍all cou	irse asse	essmer	nts.	- monuting	the time required to		
Workload of	propure	na vompren	J uli 22.	100 000		1.5.				
course	ECTS	Cont	tact hour	rs	ISIS	SIS	Total hou	ırs		
components and	credits	Lecture	Practi	ce	1					
credits per		s	sessio	ns						
trimester	5	30	2	0	10	90	150			
Course										
assessment and	Period	Δssessme	nt	Numł	Der	Fyam	Form	Schedule		
forms of	101100	tvne	/110	of poi	ints	(Weel		(Week #)		
examination	1 st attestation	Report Proposal		20		Submission of written reports		2 nd week		
		Quiz 1		15	15			3 rd week		
		Quiz 2		15	Test			4 th week		
		Weekly q	uizzes	10		Online	e test	weekly		
		on learn.a	istanait							
		Mid-term	Exam	40		Submi writter	ssion of 1 reports	5 th week		
		1 st attesta	ation	100						
		total								
	2nd attestation	Project plan		15	Subn writt		ssion of 1 reports	6 th week		
		Quiz 3		15		Test		7 th week		
		Weekly quizzes		10		Online test		weekly		
		Milestone	: 1	20		Submi writter	ssion of 1 reports	8 th week		
		End-term	Exam	40		Test		10 th week		
	2 nd attestation 100									
	Final Exam	total		100		Draiaa	t Defense	During final		
				100		riojec	t Defence	exam session		
								exam session		
	Cumulative	total for the	e course	e = 0,3	* 1 st A	tt + 0,3	* 2 nd Att +	0,4*Final = 100.		

Requirements according to the examination regulations	Course and university policies include: Attendance is mandatory. Missing 30% of lessons will result in F (Fail) grade (or summer school). Late submissions are not accepted. No cheating, duplication, falsification of data, plagiarism, and crib Contacting the Lecturer: students are welcome to arrange one-to-one meetings with the teacher during office hours to discuss the class.
Recommended	No prerequisites
Module objectives/inten ded learning outcomes	 By the end of this course students will attain the following learning outcomes. The student will show a working knowledge in: Computer systems; system concepts and architecture; Software and operating Systems; human-Computer Interaction Networks and Telecommunications; network Models; Internet technologies, cloud and mobile technologies; Database systems, data models; Cybersecurity, cybercrime, common threats; Multimedia technologies; Smart technology, IoT, data analysis.
	 to understand the roles of ICT, and to differentiate computer systems and its subsystems; to explain the purpose, content, and development trends of information and communication technologies, justify the choice of the most appropriate technology for solving specific problems; to understand methods of collecting, storing, and processing information, ways of implementing information and communication processes; to use Internet resources, cloud, and mobile services to search, store, process, and distribute information;
	 In terms of Competences, students will be able to to master modern computer technology and modern software for the definite task; to acquire the ability to work in the global Internet; to acquire skills of acquisition, analysis and processing of various types of information; to create project activities in the specialty using modern information and communication technologies. to acquire skills in work with academic, special and periodical literature in the field of information technology.
Content	This course is developed to learn the introduction to ICT and the idea of computer systems; to obtain understanding of computer systems, cybersecurity, smart technologies, human-computer interaction. Students acquire the concepts of relational databases, computer networks, cloud technologies, and gain extensive practical experience working on a project. In addition to the practical purpose, this course provides academic and educational purposes, helping to expand the horizons of students, improve their general culture and education.
Media employed	Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle.
ist inst	Dasit Litti atui t.

1. Lecture notes (available on http://moodle.astanait.edu.kz)								
2. June J. Parsons, New Perspectives on Computer Concepts 18th Edition—								
Comprehensive, Thomson Course Technology, a division of Thomson Learning, Inc								
Cambridge, MA, 2016.								
3. Reema Thareja, Fundamentals of Computers. – Oxford University press:								
Oxford, 2014.								
4. Information Communication Technologies (ISBN-978-601-7911-03-4,								
published by IITU, Almaty 2017).								
Supplementary literature:								
Online journals and articles.								

Module name:	Introudction to programming (C++)							
Code								
Trimester	1							
Person	M.Sc Nursult	an Khaimu	ldin					
responsible								
for the module								
Lecturer(s)	Askar Khaim	uldin, M.Sc	.					
	Aigerim Aiba	tbek, M.Sc						
	Nurlan Karin	nzhan MSIT	-					
	Sayatbek Ora	zbekov M.S	Sc.					
	Gulnara Mus	sina M.Sc.						
Language	English							
Relation to	Bachelor pro	grammes:						
curriculum	6B06101 Cor	nputer Scie	nce					
	6B06102 Sof	tware Engir	neering					
	6B06103 Big	Data Analy	yS1S					
	6B04101 IT I	Managemer	nt					
	Compulsory	course.						
Type of teaching	I acturas cor	ve to introdu	ice new	concen	ts and	provide	theoretical	and methodological
Type of teaching	foundations							
	Practice sessions (seminars) are active sessions to develop student's confidence							
	through new examples and discussions on the problems.							
	Instructor-si	inervised i	ndenen	dent st	udv (I	(SIS) de	als with rev	view and exploration
	in greater depth of the course material.							
	Student's independent study (SIS): Self-study time including the time required to						the time required to	
	prepare for and complete all course assessments.						ľ	
Workload of	•••	•						
course	ECTS	Cont	act hou	rs	ISIS	SIS	Total hou	rs
components and	credits	Lecture	Practio	ce				
credits per		S	sessions					
trimester	5	20	30		10	90	150	
Course		1						·
assessment and	Period	Assessment		Numb	er	Exam Form		Schedule
forms of		type		of poi	nts			(Week #)
examination	1 st	Contester 60		60		Submission of		Weekly
	attestation	problem s	et			written reports		
		Mid-term	Exam	40		MCQ a	and	5 th week
						Practic	al exam	

1					1			
		1 st attestation	100					
	2nd	Contester	60	Submission of	Weekly			
	attestation	problem set	00	written reports	Weekiy			
		End-term Exam	40	MCQ and Practical exam	10 th week			
		2 nd attestation	100					
	Final Exam	totai	100	MCQ	During final exam session			
	Cumulative	total for the course	e = 0,3 * 1	st Att + 0,3 * 2 nd Att -	+ 0,4*Final = 100.			
Requirements according to the examination regulations	 Course and university policies include: Attendance is mandatory. Missing 30% of lessons will result in F (Fail) grade (or summer school). Late submissions are not accepted. No cheating, duplication, falsification of data, plagiarism, and crib Contacting the Lecturer: students are welcome to arrange one-to-one meetings with the teacher during office hours to discuss the class. 							
Recommended	Linear Algeb	ra, Calculus I, Calc	culus II, Di	screte mathematics.				
prerequisites								
Module	D 41 1 - 4	241 :	4	· 41 . C. 11 1	•			
objectives/inten	By the end of The student	this course studen	ts will atta	in the following learn	ing outcomes.			
outcomes		will show a worki	lig Kilowie	euge m:				
outcomes	 I o demonstrate knowledge of C++ syntax To understand basic programming minimized 							
	 To understand basic programming principles To solve programming problems using C++: 							
	 To solve programming problems using C++; To apply elementary techniques involving arithmetic operators 							
	• 10 apply elementary techniques involving arithmetic operators, mathematical and logic expressions in C++ programming							
	• To de	evelop C++ program	ms that use	e sequential files for i	nput and output.			
	Students wil	I have the skill to			up ar ana carp an			
	• program with basic features of the C++ programming language							
	• write	C++ programs that	t use selec	tion (if, switch, terna	y operator)			
	• write C++ programs that use loops (while, do-while, for)							
	• under	rstand basic use of	arrays in C	C++ programming				
	• understand functions in C++ programming							
	• understand the concept of pointers in C++ programming							
	• understand the usage of structs							
	In terms of Competences, students will be able to							
	• program with basic features of the C++ programming language							
	• write C++ programs that use selection (if, switch, ternary operator)							
	• write C++ programs that use loops (while, do-while, for)							
	• understand basic use of arrays in C++ programming							
	• understand functions in C++ programming							
	• understand the concept of pointers in C++ programming							
	• understand the usage of structs							
Content	This course is	s developed to learn	n nroorami	ning fundamentals ar	d writing algorithms			
	in C++ pro	gramming language	ge. During	g this course. you	will improve your			
	programming skills, writing simple algorithms using C++ technologies.							

Media	Multimedia classrooms equipped with computer, projection and audio system;						
employed	Whiteboard; Microsoft Teams; LMS Moodle.						
Reading list	Basic Literature: 1. Lecture notes (available on moodle.astanait.edu.kz) 2. Paul & Harvey Deitel - C++ How to Program, 10th edition 3. Herbert Schildt. 2003. The Complete Reference C++, 4th edition. Supplementary literature: 1. 1. http://contester.astanait.edu.kz:31001/ 2. https://cplusplus.com/						

Module name:	Physical Edu	ucation								
Code										
Trimester	1,2,3,4									
Person	Senior lector	Senior lector N Shavakhmetov, master of pedagogical sciences								
responsible	Senior lector	Senior lector S. Askapov								
for the module	Teacher E. Z	Teacher E. Zhanabekov								
	Teacher S. Sa	advokassov	a, maste	er of peo	dagogic	al scie	nces			
Instructors	N. Shayakhm	netov, Maste	er of pe	dagogic	al scier	nces				
	S. Askapov	,	1	00						
	E. Zhanabeko	ov								
	S. Sadvokass	ova, Master	r of ped	agogica	l sciene	ces				
Language	English	,		00						
Relation to	Bachelor pro	grammes: a	ll educa	ational r	orogran	ıs				
curriculum		U		1	U					
Type of teaching	Practice sess	sions forma	tion of s	social a	nd pers	onal co	mpetencies	s of students and the		
	ability to pur	posefully us	se the m	neans an	nd meth	ods of	physical cu	ulture, ensuring the		
	preservation,	strengtheni	ing of h	ealth to	prepare	e for p	ofessional	activities; to the		
	persistent tra	nsfer of phy	sical ex	certion.	neurop	svchic	stress and a	adverse factors in		
	future work.	1 2		,	1	5				
	Student's in	dependent	study (SIS): S	elf-stud	dy time	e including	the time required to		
	prepare for a	nd complete	e all cou	irse asse	essmen	ts.	U	I		
Workload of	• •									
course	ECTS	Contact hou		rs	ISIS	SIS	Total hou	irs		
components and	credits	Lecture	Practi	ce						
credits per		s	sessio	ns						
trimester	8	-	8	30	-	160	240			
Course										
assessment and	Period	Assessme	ent	Numb	per of	Exa	m Form	Schedule		
forms of		type		points	5			(Week #)		
examination	1 st	1. Control		100		Prac	tice	3 rd week		
	attestation	standards								
		2. Control		100		Prac	tice	4 th week		
		standards								
		3. Control		100		Prac	tice	5 th week		
		standards								
		Mid-term Exam		<u>CS1+C</u>	<i>S</i> 2+ <i>CS</i> 3					
					3					
		1 st attesta	ation	100						
		total								
	2nd	1. Contro	1	100		Prac	tice	^{8th} week		
	attestation	standards								

	2. Contro standarda	ol	100	Practice	9 th week		
	3. Contro	ol	100	Practice	10 th week		
	standards	s	661 + 662 + 662				
	Mid-tern	n Exam	$\frac{cs1+cs2+cs3}{3}$				
	2 nd attest total	tation	100				
	Total grade = $\frac{Attestait}{attestait}$	ion total1	+At tot 2	<u>al2</u>			
Requirements according to the examination regulations	Course and universit Attendance is manda grade (or summer so Late submissions are No cheating, duplica Contacting the Lectu meetings with the tead	ty polici atory. N chool). not acce tion, fal urer: stu cher dur	ies include: Iissing 30% of pted. Isification of of idents are weld ing office hou	of lessons wil data, plagiar come to arrar rs to discuss	I result in F (Fail) ism, and crib age one-to-one the class.		
Recommended prerequisites	Not required						
Module objectives/inten ded learning outcomes	By the end of this cours The student will show • values of physic the body in human life; • factors that dete its components; • principles and p • ways to monitor • methodological self-improvement of ph the influence of the com on the choice of the com increasing in labor prod Students will have the - adhere to a heal	e student a workin cal cultur ermine hu patterns o r and eva foundati ysical qu ditions an itent of ir luctivity. skill to thy lifest	ts will attain the ng knowledge e and sports; th uman health, th of physical educ luate physical s ons of physical alities and pers nd nature of the ndustrial physic	e following lea in: e importance of e concept of a ation; state of the boo education, for onality traits; e work of a spe al culture aimo	orning outcomes. of physical condition of healthy image life and dy; undations ecialist ed at		
	 independently maintain and develop basic physical quality in the process of physical exercises; select necessary applied physical exercises to adapt the body to various working conditions and specific environmental influences. 						
	In terms of Competene	ces, stud	ents will be ab	le to			
	 apply various modern use methods and meth health improvement for activities that satisfy hu use methods of selection use means and methods strength, flexibility and 	concepts ods of se self-corr man need ng a set o ls of appl agility	in the field of elf-diagnosis, se rection of health ds in a rational of physical exer lied physical tra	physical cultur If-assessment, by various fouse of free tim recises for healt unings for end	re; means prms of motor he; h promotion; lurance, speed,		

Content	 The content of the program is based on the following conceptual positions: general educational orientation of the process of physical education; consistency of the educational process; professional and applied orientation of physical education; normative and methodological provision of education of students in the field of physical culture and sports; 					
Media employed	 Youtube: Nike training Home workout 					
	Online journals, article, papers, books and internet resources					
Reading list	Basic Literature:					
	1. "Theory and methods of physical education and sports: Moscow 2003" Zh.K. Kholodov, V.S. Kuznetsov					
	 Dene m\u00e4denieti men sporttyn ilimi men adistemesiOskemen, Sh\u00e5MU baspasy. 2009 Uanbaev E.K., Uanbaeva F.Zh. 					
	3. Sports theory: Оқи құraly Pavlodar: PMPI, 2013 192 p. J.A. Usin, A.M. Mamytov, S.N. Askapov					
	Supplementary literature:					
	1. The system of training athletes in Olympic sports: Moscow 2004: 820 st. Platonov V.N.					

2nd term

Module name:	Foreign Language 2: English for Academic Purposes
Code	IYa 1103
Trimester	2
Person	Group of instructors
responsible	
for the module	
Lecturer(s)	A.Ichshanova, A.Ayazbayeva, A.Urazbekova, A.Seidin, Y. Verba, S.Burbekova,
	N.Ishmukhambetov, K. Hassenov, A.Bakenova, M.Zhenisbayeva, F.Tolesh, F.
	Omarova, T.Almas, A. Salkenova, A.Rahimzhanova, S. Zhalmagambetova, A.
	Musina, M.Smagulova, M. Abzhaparova, M. Amanzhol, A. Bakenova, A.
	Ormanova
Language	English
Relation to	Bachelor programmes:
curriculum	6B06101 Computer Science
	6B06102 Software Engineering
	6B06103 Big Data Analysis
	6B04101 IT Management
Type of teaching	
	Practice sessions (seminars) are active sessions to develop student's confidence
	through new examples and discussions on the problems.
	Instructor-supervised independent study (ISIS) deals with review and exploration
	in greater depth of the course material.
	Student's independent study (SIS): Self-study time including the time required to
	prepare for and complete all course assessments.

Workload of									
course	ECTS	Cont	rs	ISIS	SIS	Total hou	rs		
components and	credits	Lecture	Practi	ce					
credits per		s session		ns					
trimester	5		5	0	10	90	150		
Course		Ι.						~	
assessment and	Period	Assessme	nt	Numb	per	Exam	Form	Schedule	
forms of	1 st	type	<u> </u>	of poi	nts	0	. 1 1	(Week #)	
examination		Syllabus (Quiz	2		Compi	iter based	1 st week	
	attestation	APA in-te	ext	5		Compu	uter based	2 nd week	
		citation Q	uiz	0		0 1 1	C	ard 1	
		Paraphras	ing	8		Oral de	eiense	3 rd week	
		Summorio	ina						
		activity	sing						
		Introducti	on	5		Comp	iter based	4 th week	
		structure	Ouiz			compt	ater bused	1 WCCK	
		Midterm	Zuil	10		Compi	iter based	5 th week	
		Grammar	_			r -			
		Vocabula	ry						
		Quiz	-						
		1 st attesta	tion	30					
		total							
	2nd	Writing an		5		Submission of		6 th week	
	attestation	evidence-	based			writter	1 work		
		problem of	or						
		solution							
		paragraph		5		01.1	- C	7th	
		nrecenteti	roup	3		Oral de	elense	/ week	
		"Dos and	don'ts						
		of academ	uon ts						
		writing							
		Paragraph and		5		Compi	uter based	8 th week	
		conclusio	n					•	
		structure	quiz						
		APA		5		Compu	uter based	9 th week	
		referencin	ng						
		Quiz							
		Endte	rm	10		Compu	uter based	10 th week	
		Gramn	nar-						
		Vocabu	ılary						
		Qui	Z 	20					
		2 attest	auon	30					
	Final Fram			40		Comm	iter based	During final	
		n		יד		aniz	ater based	exam session	
				I		<u>1""</u>		enum bebbion	
	Cumulative	total for the	e course	e = 0.3	* 1 st A	.tt + 0.3	8 * 2 nd Att -	+ 0,4*Final =	
	100.								

Requirements according to the examination	Course and university policies include: Attendance is mandatory. Missing 30% of lessons will result in F (Fail) grade (or summer school).							
regulations	Late submissions are not accepted. No cheating, duplication, falsification of data, plagiarism, and crib Contacting the Lecturer: students are welcome to arrange one-to-one meetings with the teacher during office hours to discuss the class.							
Recommended prerequisites	Foreign Language 1: English for academic purposes							
Module objectives/inten ded learning outcomes	 By the end of this course students will attain the following learning outcomes. The student will show a working knowledge in: developing writing and reading abilities in a variety of academic settings developing listening and speaking skills through lectures, seminars and presentations within a university context 							
	 Students will have the skill to: follow a range of formal and informal discussions in academic contexts follow lectures and presentations take notes from aural input for further study purposes participate in formal and informal classroom discussions and conversations ask and respond with appropriate syntax and vocabulary to open-ended higher-order thinking questions Interact with peers to give and receive constructive feedback In terms of competences, students will be able to apply critical reading skills write summaries of academic literature know the key components of an academic essay 							
	 how to construct an effective thesis statement how to build clear topic sentences 							
	 how to build clear topic sentences how to paraphrase and how to conclude essays 							
Content	English for Academic Purposes is designed to help students focus on basic skills in academic writing, reading, listening and speaking with an emphasis on the rules of academic English style, research and academic vocabulary and academic language use. The course is developed in accordance with the aims and learning outcomes of the educational requirements of the BA degrees in Computer Science, Software Engineering, Big Data Analysis, Media Technologies, Mathematical and Computational Science, Cyber Security, Smart Technologies, Digital Journalism, IT Management, IT Entrepreneurship, Digital Public Administration and Services, Industrial Internet of Thing, so that the students can successfully apply their knowledge and skills gained in the course in other subjects, demonstrate their academic English language competence, and successfully accomplish the Astana IT University coursework assignments.							
Media employed	Multimedia classrooms equipped with computer, projection and audio system; Whiteboard: Microsoft Teams: LMS Moodle.							
Reading list	Main literature:1.De Chazal, E., & Moore, J. (2021). Oxford EAP: A Course in English forAcademic Purposes. Advanced/C1. Oxford University Press.2.The audio and video materials are available athttps://elt.oup.com/student/oxfordeap/c1?cc=kz&selLanguage=en3.Paterson, K. (2017). Oxford Grammar for EAP. London: Oxford UniversityPress.Supplementary literature:4.Bailey, S. (2018). Academic Writing: A Handbook for International Students(5 th ed.). Routledge.							

1		
	5. Language instructors will weekly post addition PowerPoint presentations, and website links on Moodle	al sources such as readings,

Module name:	Second forei	gn languag	ge-Chin	ese lan	guage	;			
Code	IYa 1103								
Trimesters	1-2								
Person	Senior-lectur	er, Master o	of pedag	gogical s	scienc	es Musi	na A.O		
responsible									
for the module									
		0							
Lecturer(s)	A.Musina, M	.Sc.							
Language	Chinese	Chinese							
Relation to	Bachelor pro	Bachelor programmes:							
curriculum	6B06101 Con	nputer Scie	ence						
	6B06102 Sof	tware Engin	neering						
	6B06103 Big	Data Anal	ysis						
	6B04101111	vianagemei	l						
Type of teaching	Lectures serv	ve to introdu	ice new	concen	ts and	provide	theoretical	and methodological	
Type of teaching	foundations.	e to mirou		concep	to und	provide	licorelicu	una methodological	
	Practice ses	sions (semi	inars) a	re activ	ve ses	sions to	develop s	tudent's confidence	
	through new	examples a	nd discu	ussions	on the	probler	ns.		
	Instructor-s	upervised i	ndepen	dent st	udy (l	Í SIS) de	als with rev	view and exploration	
	in greater dep	oth of the co	ourse ma	aterial.				_	
	Student's in	dependent	study (SIS): S	elf-stı	udy time	e including	the time required to	
	prepare for a	nd complete	e all cou	irse asse	essme	nts.			
Workload of		~				~~~~			
course	ECIS	Cont	act hou	rs	ISIS	SIS	Total hou	rs	
components and	credits	Lecture	Practi	ce					
trimester	10	S	sessio	ns	20	190	200		
timester	10	-	10	50	20	180	300		
Course									
assessment and	Period	Assessme	ent	Numb	ber	Exam	Form	Schedule	
forms of		type		of poi	nts			(Week #)	
examination	1 st	Assignme	ent 1	30		Submi	ssion of	Weekly	
	attestation	_				writter	n work		
		Assignme	ent 2	30		Writte	n	3 rd week	
		Mid-term	Exam	40		Writte	n	5 th week	
		1 st attesta	ntion	100					
		total							
	2nd	Assignme	ent 3	30		Submi	ssion of	Weekly	
	attestation					writter	ı work,		
						text an	d essay		
						on the	certain		
		A		20		topic		Oth area all	
		Assignme	:iit 4	30		w ritte	[]	о- week	
		End-term	Exam	40		Writte	n	10 th week	

	2 nd atte	estation	100						
	total	cstation	100						
	Final Exam		100	Mixed format	During final exam session				
	Cumulative total for the course = $0,3 * 1^{st} Att + 0,3 * 2^{nd} Att + 0,4*Final = 100.$								
Requirements	Course and univer	sity polic	ies includ	le:					
according to the	Attendance is mandatory. Missing 30% of lessons will result in F (Fail)								
examination	grade (or summer school).								
regulations	Late submissions are not accepted.								
	No cheating, duplication, falsification of data, plagiarism, and crib								
	meetings with the te	acher dur	ing office	hours to discuss th	e class				
	meetings with the te	acher dui			c ciass.				
Recommended prerequisites	Foreign language1 and 2								
Module	By the end of this cou	rse studen	ts will atta	in the following learn	ing outcomes.				
objectives/inten	The student will show	w a worki	ng knowle	edge in:	. 1				
ded learning	1. Improving the hieroglyphs	reading te	echnique fo	or the pinyin transcrip	otion and				
outcomes	2. recognizing m	neaningful	phonemes	, rhythmic patterns, p	hrases				
	3. understanding	dialogues	and video	materials					
	4. understanding	the main	content of	texts					
	Students will have the	e skill to:							
	2. compose and	analyze the	e structure	of the hieroglyph, to	determine the key				
	blocks of hieroglyphs	5			-				
	3. compose a wr	itten mess	age of diff	erent volume and con	tent within the				
	studied topics	ition short	essay int	eractive dialogues etc					
	5. develop vocat	oulary and	sentence s	tructure	•				
	6. use in everyda	ay situation	ns through	various forms of oral	practice				
	7. express thems	elves with	the right	words and phrases					
	8. read and write	e snort para lices stude	agrapns ents will h	e able to•					
	1. understand ba	sic comm	unication						
	2. develop comn	nunicative	skills						
	3. use oral and w	vritten Chi	nese at the	beginner level.	:				
	relationship	ocabulary	consolida	ed through conversat	ion stressing the				
	5. between langu	age and c	ulture						
Content	Chinese Language is	designed	to help st	udents focus on basi	c skills in listening,				
	reading, writing and s	peaking w	vith an em	phasis on the rules of	f simplified Chinese.				
	IT Entreprene	urshin. Co	mnuter	Science.	Telecommunication				
	Systems, Cybersecurit	ty, IT Mai	nagement,	Digital Journalism,	Media Technology,				
	Big Data, Software	Engineerir	ng and Ir	dustrial Automation	Program aims and				
Madia	learning outcomes.	aquinna	d with oon	mutar projection and	audio aveter				
employed	Whiteboard; Microsof	t Teams; I	LMS Moo	fle.	audio system,				
Reading list	Main:	ningga lar		volumes 2 volumes					
	Alexander Fedorovich	i Kondrasł	suage. III 2 nevsky	volumes. 2 volumes					

Eastern book publishing house, 2018 ISBN 978-5-907086-04-3
Сирко Е.В. (2006). 北京语言大学出版社,新使用汉语课本1课本
Сирко Е.В. (2006). 北京语言大学出版社, 新使用汉语课本1课本 exercise book
Recommended: Teaching manual of Chinese for students of non-linguistic specialties (1st year), 2021, Musina A.O.

Module name:	German lan	guage A1.2						
Code								
Trimester	1 and 2							
Person	A. Baizl	nanova, MS	c					
responsible								
for the module								
Lecturer(s)	Baizhanova,	MSc.						
Language	English, Gerr	man						
Relation to	6B06101 - C	omputer Sc	ience;					
curriculum	6B06102 - S	oftware Eng	gineerin	g;				
	6B06103 – B	ig Data An	alysis;					
	6В04101 - ІТ	Managem	ent.					
	Non-compuls	sory course.						
Type of teaching	Lectures ser	ve to introd	uce new	gramn	nar top	oics and	vocabulary	/.
	Practice ses	sions (semi	i nars) a	ire activ	ve ses	sions to	develop s	student's confidence
	through new	examples a	nd discu	issions	on the	topics.	-	
	Instructor-s	upervised i	ndepen	dent st	udy (l	[SIS) de	als with rev	view and exploration
	in greater dep	oth of the co	ourse ma	aterial.				
	Student's in	dependent	study (SIS): S	elf-stı	ıdy time	e including	the time required to
	prepare for a	nd complete	e all cou	rse asse	essmer	nts.		
Workload of		1						
course	ECTS	Cont	act hour	rs	ISIS	SIS	Total hou	rs
components and	credits	Lecture	Practi	ce				
credits per		S	sessio	ns		_		
trimester	10		1(00	20	180	300	
Course								
assessment and	Period	Assessme	ent	Numb	ber	Exam	Form	Schedule
forms of		type		of poi	nts			(Week #)
examination	1 st	Projekt 1.	Mein	20		Submi	ssion and	5 th week
	attestation	Tag				defens	e of	
						presen	tation	
		Quiz		10		Writte	n	5 th week
	2nd	Projekt 2.	Mein	20		Submi	ssion and	10 th week
	attestation	Lieblings	fest			defens	e of	
						presen	tation	
		Quiz		10		Writte	n	10 th week
	Final Exam			40		Oral		During final
								exam session

	Cumulative total for the course = $0,3 * 1$ st Att + $0,3 * 2$ nd Att + $0,4*$ Final.
Requirements according to the examination regulations	Course and university policies include: Attendance is mandatory. Missing 30% of lessons will result in F (Fail) grade (or summer school). Late submissions are not accepted. No cheating, duplication, falsification of data, plagiarism, and crib Contacting the Lecturer: students are welcome to arrange one-to-one meetings with the teacher during office hours to discuss the class.
Recommended prerequisites	German language A1.1
Module objectives/inten ded learning	By the end of this course students will attain the following learning outcomes. The student will show a working knowledge in:
outcomes	 rules for reading, pronunciation and writing of vowels, consonants and letter combinations; the lexical side of speech in the volume of levels A1.2 (including both stylistically neutral lexical units and elements of everyday colloquial speech); the main grammatical structures characteristic of oral and written speech of everyday communication (at level A1.2).
	 Students will have the skill to: - understand individual phrases and frequently used vocabulary, in statements on topics related directly to the student (for example, basic personal and family data, shopping, place of residence, work); - understand the main points in short, clear and simple messages and
	 announcements. read and understand the content of short, simple texts; find specific, easily predictable information in simple texts of everyday communication: in advertisements, brochures, menus, schedules, announcements; understand short, simple letters of a personal nature; communicate in simple typical situations that require a direct exchange of information within the framework of familiar topics and activities; use simple phrases and sentences, talk about their family and other people, living conditions, studies, daily activities in the form of a series of short simple phrases and sentences in the form of a list.
	 In terms of competences, students will be able to: use the basics of writing (recording information, making a plan, making notes); conduct everyday correspondence; deliver a public speech (to form an oral message, a monologue, to make a report, a presentation); dialogical speech (to implement a basic communication).
Content	German Language A1.2 is designed to prepare students to use German for their needs and interests in real-life situations and work. Additionally, this course will further give the students the possibility to communicate on general social topics, free communication in English speaking environment and understanding texts of general use. Much emphasis is placed on speaking, reading and writing skills and on the projects to represent the learners' achievement.
Media employed	Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle.

Reading list	Basic Literature: Niebisch, D., Penning-Hiemstra, S., Specht, F., Bovermann, M., Pude, A., Reimann, M. (2022). Hueber Verlag. Schritte International Neu. A1.2. The textbook is on Moodle/Microsoft Teams.
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		14						
Module name:	Cultural Stu	dies						
Code								
Trimester	2 trimester (a	ll majors o	f bachel	or degr	ee; dep	pending	on the RU	JPs of programmes)
Person	Assoc. Prof.	A. Uyzbaye	eva, PhI)				
responsible								
for the module								
Lecturer(s)	Assoc. Prof. A. Uyzbayeva, PhD							
Longuage	Assistant pro	tessor, A. F	Kakhimz	zhanova	i, PhD			
Language Relation to	English Bachalar pro	grommag. I	Jistory	of Kozo	lehotor	Dhilor	onhy	
curriculum	Compulsory	course		JI Kaza	KIIStal	1, 1 11105	sopny.	
eurrieurum								
Type of teaching	Lectures ser	ve to introdu	uce new	concep	ts and	provide	theoretica	and methodological
	foundations.			-		-		-
	Practice ses	sions (sem	inars) a	re activ	ve ses	sions to	o develop	student's confidence
	through new	examples a	nd discu	issions	on the	problem	ms.	
	Instructor-s	upervised i	indepen	dent st	udy (I	SIS) de	als with re	eview and exploration
	Student's in	denendent	study ($SIS \cdot S$	elf_sti	udv time	e including	the time required to
	prepare for a	nd complete	e all cou	irse asse	essmei	nts.	e meruam	, the time required to
Workload of		I						
course	ECTS	Cont	tact hou	rs	ISIS	SIS	Total ho	urs
components and	credits	Lecture	Practi	ce				
credits per		S	sessio	ns				
trimester	2	10	1	0	10	30	60	
Course								
assessment and	Period	Assessme	ent	Numł	ber	Exam	Form	Schedule
forms of	1 chioù	tvpe		of poi	ints	L'Adin i orini		(Week #)
examination	1 st	Oral		30		Oral defence		3 rd week
	attestation	presentati	ion					
		Online ga	ame	30		Oral answers		4th week
		Mid-term	MCQ	30		Test		5 th week
		(multiple	-					
		L octures	uz) onlina	10		Ouiz		Weekly
		academy	omme	10		Quiz		WEEKIY
		1 st attests	ation	100				
		total		1.00				
	2nd	Oral		30		Oral d	efence	7th week
	attestation	presentati	ion					
		SWOT at	nalysis	30		Oral d	efense	9th week

		End-term MCQ	30	Test	10 th week					
		(multiple-								
		Lectures online	10	Quiz	Weekly					
		academy	100							
		2 nd attestation	100							
	Final Exam	lotai	100	MCQ	During final					
					exam session					
	Cumulative	total for the course	e = 0,3 * 1	$1^{\text{st}} \text{Att} + 0,3 * 2^{\text{nd}}$	Att + 0,4*Final = 100.					
Requirements	Course and university policies include:									
examination	grade (or si	immer school).	11551ng J	0 /0 01 1850115	win result in r (ran)					
regulations	Late submis	sions are not acce	epted.							
	No cheating	g, duplication, fa	lsificatio	n of data, plag	iarism, and crib					
	Contacting	the Lecturer: stu	idents are	e welcome to ar	range one-to-one					
	meetings wi	th the teacher dur	ing office	e nours to discu	ss the class.					
Recommended	History of Ka	azakhstan.								
prerequisites	Dry the and at	f this source studen	ta mill atte	ain the fellowing	learning outcomes					
objectives/inten	By the end of	this course studen	is will alla	ain the following	learning outcomes.					
ded learning	The student	will show a worki	ng knowl	edge in:						
outcomes	• theor	ies and approaches	to the stu	dy of culture;						
	• the b	asic principles of c	ulture;	rrent problems in	culture:					
	deser critic	al thinking and app	olying it in	n practice	culture,					
	Students wil	l have the skill to								
	• to ex	plain and interpre	t knowled	lge (concepts, id	leas, theories) in cultural					
	studies;									
	• to ex	plain the socio and	ethical va	alues of society a	s a product of integration					
	• to exp	plain the nature of s	situations	in various spheres	s of social communication					
	based on the	content of theories	and ideas	of cultural studie	es discipline;					
	development	in Kazakhstan;	reasonat	by about the va	arious stages of cultural					
	• to ex	xpress correctly a	nd defen	d reasonably o	wn opinion on socially					
	significant is	sues.								
	In terms of (Competences, stud	lents will	be able to						
	• comr	nunicate constructi	vely in di	fferent environm	ents, collaborate in teams					
	and negotiate	e, show tolerance, e	xpress and	d understand diffe	erent viewpoints;					
	Select locate	e, organize, and int	erprete in	, formation, and tal	ke notes.					
Content	This course i	s oriented to revea	l the featu	ires of national cu	ulture development in the					
	context of the global culture and civilization. Topics include: structure									
	development	of culture in Kazal	s of cult chstan from	ure, anatomy of mancient times up	i culture, and historical intil modern days					
Media	Multimedia c	lassrooms equippe	d with cor	nputer, projection	n and audio system;					
employed	Whiteboard;	Microsoft Teams;	LMS Moo	odle, Online acade	emy					
	(https://learn.	<u>astanait.edu.kz/).</u>								

Reading list	Basic Literature: 1. Gabitov T. «Actual Problems of Kazakh Culture. Kazakh Culture Challenges» Saarbrücken: Lambert publishing, 2016.						
	2. Handbook of Cultural Studies and Education. /P.T. Peter 1 ed Great Britain: Routledge and Taylor & Francis Group, 2019 531 p ISBN 9780815385097: 52800.00.						
	3. Introducing Cultural Studies /L. Brian 3 ed Oxon: Routledge, 2017 459 p ISBN 9781138915725: 27500.00.						
	4. Cultural Studies: Theory and Practice/ B. Chris, A. J. Emma 5 ed Great Britain: SAGE Publications, 2016 722 p ISBN 9781473919457: 28900.00.						
	Supplementary Literature:						
	1. Murashcenkova, N.V. (2022), Ethnic, Civic, and Global Identities as Predictors of Emigration Activity of Student Youth in Belarus, Kazakhstan, and Russia (article). Cultural-Historical Psychology, 2022 Vol.18, No. 3. doi:10.17759/chp.2022180314						
	2. Globalisation and culture (article)(http://socialalternatives.com/) - Culture, Tradition and Globalisation: Some Philosophical Questions - Vol. 35 No. 1, 2016						
	3. Seksenbayeva, G. (2019) Archives and Records (article) Formation and development of the Central State Archive of cinema, photographic materials and sound records of the Kazakh SSR (1943–1991). The Journal of the Archives and Records Association. Vol.40 No.3 (https://doi.org/10.1080/23257962.2019.1592746)						
	4. Hall G., Birchall C. New cultural studies: adventures in theory - Edinburgh University Press. 2006 // https://web.p.ebscohost.com/ehost/detail/detail?vid=0&sid=05424f3f-d996-4bd1- b47f- b61e26c93c2a%40redis&bdata=Jmxhbmc9cnUmc2l0ZT1laG9zdC1saXZl#AN=17 9721&db=nlebk						
	5. D. Jones, M. Marion. The dinymis of counterpoint in Asian Studies - Albany: SUNY Press. 2014//https://web.p.ebscohost.com/ehost/detail/detail?vid=0&sid=4e0c27a1-9014- 4623-8465- bd3895859b57%40redis&bdata=Jmxhbmc9cnUmc2l0ZT1laG9zdC1saXZl#AN=70 6808&db=nlebk						
	6. L. Steiner, C. Christians Key concepts in critical cultural studies - rbana [III.] : University of Illinois Press. 2010//https://web.p.ebscohost.com/ehost/detail/vid=0&sid=2159bc8c-a4e8- 4956-a40a- 02c527a53f23%40redis&bdata=Jmxhbmc9cnUmc2l0ZT1laG9zdC1saXZl#db=nleb k& N=569700						
	 7. Journal of Muslim Minority Affairs. Apr2002, Vol. 22 Issue 1, p11. 28p. (doi: 10.1080/13602000220124818) - Soviet Nationality, Identity, and Ethnicity in Central Asia: Historic Narratives and Kazakh Ethnic Identity 						
	8. Archives and Records (article) Formation and development of the Central State; Archive of cinema, photographic materials and sound records of the Kazakh SSR						

(1943–1991) - Formation and development of the Central State Archive of cinema,
photographic materials and sound records of the Kazakh SSR (1943–1991)
(https://doi.org/10.1080/23257962.2019.1592 746)
9. Культурология [Текст]: учебник. / Л.П. Воронкова - 2-е изд Москва: Юрайт,
2021 202c ISBN 978-5-534-07934-0: 8800.00.
10. Культурология [Текст]: учебное пособие для СПО / под ред.И.Ф.Кефели
2-е изд Москва : Юрайт, 2021 165с ISBN 978-5-534-89560-5: 7500.00.

Module name:	Discrete Mat	thematics						
Code	DM 1205							
Trimester	2							
Person	Assoc. Prof.	Nurlan Ism:	ailov, P	hD				
responsible			<i>,</i>					
for the module								
Lecturer(s)	Nurlan Ismai	lov						
	Shynar Abuta	Shynar Abutalipova						
	Tolkynay Ye	Tolkynay Yelemes						
	Moldir Toleu	bek						
Language	English							
Relation to	Bachelor prog	grammes:						
curriculum	6B06101 Cor	nputer Scie	nce .					
	6B06102 Sor	tware Engir	ieering					
	6B06103 Big	Data Anaiy	ysis					
		Managemen	it					
	Compulsory course.							
Type of teaching	Lectures ser	ve to introdu	ice new	concep	ts and	provide	theoretical	and methodological
1,1,2,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,	foundations.	••••	1001101	Concer 1		P10.121		und mouro sere Bress
	Practice ses	sions (semi	nars) a	re activ	ve ses	sions to	develop s	tudent's confidence
	through new	examples a	nd discu	ussions	on the	probler	ms.	
	Instructor-s	apervised i	ndepen	dent str	udy (I	ÍSIS) de	als with rev	view and exploration
	in greater dep	oth of the co	ourse ma	aterial.				
	Student's in	dependent	study (SIS): S	elf-stu	ıdy time	e including	the time required to
	prepare for an	nd complete	all cou	rse asse	essmer	nts.		
Workload of			<u> </u>		1010		T (11)	
course	ECIS	Cont	act hour	rs	1815	515	Total hou	rs
components and	creatis	Lecture	Practic	ce				
trimester	5	<u> </u>	session	ns	10		150	
unnester		30	2	0	10	90	130	
Course								
assessment and	Period	Assessme	nt	Numb	ber	Exam	Form	Schedule
forms of		tvpe		of poi	nts		1 01111	(Week #)
examination	1 st	Problem S	Sets	20		Submi	ssion of	2 nd week and 4 th
	attestation					writter	1 reports	weeks
		Quiz		20		Writte	<u>n</u>	3 rd week
		Mid-term	Exam	60		Writte	n	5 th week
		1 st attesta	tion	100				
		total						

	2nd	Problem Sets	20	Submission of	7 th week and 9 th			
	attestation	Ouiz	20	Written reports	8 th week			
		End-term Exam	60	Written	10 th week			
				witten	10 WCCK			
		2 nd attestation total	100					
	Final Exam		100	Written	During final exam session			
	Cumulative	total for the course	$e = 0,3 * 1^{st} Att + 0,3 * 2^{nd} Att + 0,4*Final = 100.$					
Requirements according to the examination regulations	In case if the student did not attend more than 30% of the classes without an reasonable excuses, the teacher has a right to mark him as "not graded", and the student wouldn't be admitted to the exam. In other words, students must participate in at least 70% of all online/offline class time, otherwise he/she fails the course.							
Recommended prerequisites	No prerequisites (it is enough to know school mathematics program well)							
Module objectives/inten ded learning outcomes	Course goal(s): Course goal is to familiarize students with an initial base in mathematics such as sets, basic of combinatorics and graph theory. The main goal is to be able to apply above-mentioned tools to problems in postrequisites courses.							
	 By the end of this course students will attain the following learning outcomes. The student will show a working knowledge in: To demonstrate knowledge of mathematical knowledge; To understand basic mathematical principles (proving, counting, understanding discrete objects); To solve counting problems using different enumeration methods; To apply basic techniques involving discrete objects such as sets, functions, graphs and mathematical expressions in discrete mathematics; To develop mathematical abilities in writing programs by computers. Students will have the skill to: Basic school mathematical knowledge; Ability to construct examples and counterexamples 							
	 In terms of Competences, students will be able to: Learn main proof techniques of mathematics; Be familiar with important discrete objects; Understand counting principles of combinatorics; Be able to transform discrete problems into simple forms; 							
Content	The course i counting, nur theory.	ncludes logics, se mber theory, inclus	t theory, sion-exclu	functions, and fundations functions functions functions functions functions functions for the function of the	mental principles of ence relations, graph			
Media employed	Multimedia c Goodnotes; N	lassrooms equippe Aicrosoft Teams; L	d with cor MS Mood	nputer, projection and lle.	l audio system;			
Reading list	1. Lecture presentations. Main textbooks: 2. E. Goodaire and M. Parmenter Discrete Mathematics with Graph Theory (third edition); 3. Kenneth H. Rosen. Discrete Mathematics and Its Applications (seventh edition); Additional textbooks:							

4. Ralph P. Grimaldi. Discrete and Combinatorial Mathematics (fifth edition);
5. А.С. Джумадильдаев, Элементы дискретной математики, Алматы, 2004;
6. Д. Андерсон Дискретная математика и комбинаторика. 2004;
Open Online Resources
1. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-042j-
mathematics-for-computer-science-fall-2010/
2. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-042j-
mathematics-for-computer-science-spring-2015/index.htm

Module name:	Web Technologies 1 (Front End)									
Code										
Trimester	2									
Person	Zhantileuov I	Eldiyar M.S	sc.							
responsible		•								
for the module										
Lecturer(s)	G. Yegember	G. Yegemberdiyeva, M.Sc.								
	A. Salkenov,	A. Salkenov, M.Sc.								
Language	English	English								
Relation to	Bachelor pro	Bachelor programes:								
curriculum	606101 Co	6D06101 Computer Science								
	6B06102 Sof	Ilpuier Solo Tware Engi	neering							
	6R06103 Bio	Data Analy	veie							
	6B04101 IT	Managemer	nt							
	Compulsory course.									
Type of teaching	Lectures serv	Lectures serve to introduce new concepts and provide theoretical and methodological								
	foundations.									
	Practice ses	Practice sessions (seminars) are active sessions to develop student's confidence								
	through new	examples a	nd discu	ISSIONS	on the	problem	ns.	• 1		
	Instructor-si	apervisea i	naepen	dent su	udy (I	ISIS) ae	als with rev	new and exploration		
	Student's in	denendent	etudy (eteriai.	≏lf_stı	dy time	including	the time required to		
	prepare for at	nd complete	siduy (all cou	rse asse	essme	nts.	Including	the time required to		
Workload of	propule for	lu compress	- un	100 0000	/001110.	11.5.				
course	ECTS	Cont	act hour	rs	ISIS	SIS	Total hou	rs		
components and	credits	Lecture	Practi	ce						
credits per		s	sessio	ns						
trimester	5	20	3	0	10	90	150			
Course		1		· .		1		· · · · · · · · · · · · · · · · · · ·		
assessment and	Period	Assessme	ent	Numb	ber	Exam	Form	Schedule		
forms ot		type		of poi	nts			(Week #)		
examination		Assignme	ent l	40		Projec	t	2 ^{nu} week		
	attestation	Assignme	$\frac{1}{2}$	40		Projec	t	4 rd week		
		M1d-term	Exam	20		MCQ		5 th week		
		1 st attesta	tion	100						
		total	. 2	40		р [.]		ath 1		
		Assignme	ent 3	40		Projec	t	/" week		

		Assignment 4	40	Project	9 th week			
	2nd	End-term Exam	40	MCQ	10 th week			
	attestation	2 nd attestation total	100					
	Final Exam		100	Final Project Defense	During final exam session			
	Cumulative	+ 0,4*Final = 100.						
Requirements according to the examination regulations	Course and Attendance grade (or su Late submis No cheating Contacting meetings wi	university polic is mandatory. M ummer school). sions are not acce g, duplication, fa the Lecturer: stu th the teacher dur	ies includ Aissing 30 epted. Isification adents are ing office	le:)% of lessons will n of data, plagiari welcome to arrang hours to discuss th	result in F (Fail) sm, and crib ge one-to-one he class.			
Recommended prerequisites	Basic programming skills							
Module objectives/inten ded learning outcomes	By the end of The student Creat Gath critical decisi Intera fellow studer Students wil Good technologies. In terms of C Orga Deve Bootstrap and Orga Deve Bootstrap and Deliv compelling a Discu	f this course studen will show a worki te, debug, and main er, organize, and p ons; act, collaborate and its I have the skill to erstanding of web d I knowledge in w Competences, stud nize, browse, edit a lop, validate and d JavaScript; ver short, easy presend supported by event findings in an or uss the notion that ges and disadvanta best fits into the no	ts will atta ng knowle atain profes present infe d commur evelopmen web devel lents will l and manag debug in sentations idence; rganized an every prof ges, and th m-technica	in the following lear edge in: ssional websites; ormation to help a d nicate effectively with ht; opment including be able to e a variety of file typ iteractive websites and documents that and compelling manne- olem has multiple so nat success is tied to <u>l dimensions of a sp</u>	ning outcomes. client make business- th the instructor and CSS and JavaScript es; using HTML, CSS, are well considered, er; olutions, each with its ofinding the technical ecific problem			
Content	Course goal i as HTML, C course mater Frontend We	s to introduce stude SS, JavaScript. Fu ials will assist stu b Developer.	ents to web rthermore, dents in d	t will cover Boots leveloping skills ne	on technologies such trap and Jquery. this cessary to work as a			
Media employed	Multimedia c Whiteboard;	lassrooms equippe Microsoft Teams; I	d with con LMS Mood	nputer, projection an ille.	d audio system;			
Reading list	Basic Litera 6. Ben I proof response	ture: Frain. Responsive V sive websites using	Web Desig the latest F	n with H'I'ML5 and TTMT-S and CSS te	CSS: Develop future- chniques, 3rd Edition.			

1	7.	Flan	agan David	l. JavaScript:	The D	efinitive C	Buide.		
	8.	Jon	Duckett.	.JavaScript	and	.jQuery:	interactive	front-End	Web
	Develo	pmen	t.	_					

Module name:	Object-orien	ited progra	amming	; (Java))				
Code									
Trimester	2								
Person responsible for the module	Senior-lecturer A. Khaimuldin, MSc								
Lecturer(s)	1.Ching2.Rysp3.Nurg4.Smak5.Khaii6.Baizl7.AimuEnglish	 Chingis Kharmyssov, PhD Ryspayeva Marya Nurgazina Dana Smakova Saida Khaimuldin Nursultan, MSc Baizhaksynov Daniyar Aimukhambetov Olzhas English							
Relation to	Bachelor pro	ogrammes:	Softwa	re Eng	ineerii	ng, Cor	nputer Sci	ence. (Programmes	
curriculum	under accred	litation are	listed)			-6)	-1		
Type of teaching	 Lectures serve to introduce new concepts and provide theoretical and methodological foundations. Practice sessions (seminars) are active sessions to develop student's confidence through new examples and discussions on the problems. Instructor-supervised independent study (ISIS) deals with review and exploration in greater depth of the course material. Student's independent study (SIS): Self-study time including the time required to prepare for and complete all course assessments. 								
Workload of	「 <u> </u>								
course	ECTS	Cont	tact hou	rs	ISIS	SIS	Total hou	rs	
components and	credits	Lecture	Practi	ce					
credits per		<u>s</u>	sessio	ns	10	00	140		
timester	5	20	3	0	10	80	140		
Course									
assessment and	Period	Assessme	ent	Numt	ber	Exam	Form	Schedule	
examination	1 st		ents	40	IIIS	Submi	esion of	2 nd week	
Chuillinuich	attestation	100151111	1113			solutio	ons (java	4 th week	
						files)			
		Quiz		20		MCQ		3 rd week	
		Mid-term	Exam	40		MCQ		5 th week	
		1 st attests	ation	100					
		total		10		<u> </u>	· .	7th 1	
	2nd	Assignme	ents	40		Submi	SSION OI	^{7th} Week	
	attestation					(Projec	et	J WEEK	
						milesto	ones)		
		Quiz		20		MCQ		8 th week	

		End-term Exam	40	Project defence	10 th week		
		2 nd attestation total	100				
	Final Exam		100	MCQ	During final exam session		
	Cumulative total for the course = $0.3 * 1^{st} Att + 0.3 * 2^{nd} Att + 0.4*Fina$						
Requirements according to the examination regulations	Course and Attendance grade (or su Late submis No cheating Contacting meetings wi	university polic is mandatory. M ummer school). sions are not acce g, duplication, fa the Lecturer: stu th the teacher dur	ies inclue Aissing 3 epted. Isificatio Idents are ring office	de: 0% of lessons will n n of data, plagiaris e welcome to arrang e hours to discuss th	result in F (Fail) m, and crib e one-to-one e class.		
Recommended prerequisites	Introduction	to Programming 1.					
Module objectives/inten ded learning outcomes	By the end of The student • The polymorphism • Java • Divice • Objec • Ident • Work • Codin • Divice • Cons violating the • Impro- modules. • Fram • Cons violating the • Impro- modules. • Fram • Cons violating the • Impro- modules. • Fram • Cons • Cope • Set a • Write In terms of C • Incre • Obta: • Apply	f this course studen will show a worki concepts of objec n, data hiding, and specifics: language le and Conquer stra ct-Oriented design ifying the boundari cing with data from ng in general using ling responsibilities tional design patter I have the skill to truct well-designe boundaries of response to the structure e the objects in the truct efficiently a with troubleshooti connection to varie e a sequential and r Competences, stud ase productivity by in flexibility throug I scalable and main gn a class that server y gathered knowled	ts will atta ng knowl et-oriented inheritance features, ategy in the principles ies of an or a different interfaces s among c ns (Single ed classes onsibility. of softwater ligned in ang and error ous databater eadable co lents will y using libred the principles and classes onsibility. of softwater ing and error ous databater eadable co lents will y using libred the principles and a problem ous databater and and error ous databater and and error ous databater ang and error ous databater and error	ain the following learn edge in: design, data abstraction ce. JVM, GC, JDBC, etc. e context of objects. by Robert C. Martin (bject according to the sources: console, file, s and behavior segrega lasses and component ton, Builder, Factory) for effective proble are programs by org domain to those in the terfaces with concret ror handling. ases using JDBC. ode. be able to raries and reusable coor ciples of polymorphis oftware. gram module or packa development process.	ing outcomes. etion, encapsulation, (SOLID). level of abstraction. database, etc. ttion. s. em solving without anizing classes into program. te area of behavior de. m. age.		

Content	This course covers object-oriented programming principles and techniques using Java programming language. Topics include classes, abstraction, data hiding, encapsulation, inheritance, polymorphism, programming paradigms and SOLID principles. Additionally, the course provides the basic concepts for software design and reuse.
Media	Multimedia classrooms equipped with computer, projection, and audio system;
employed	Whiteboard; Microsoft Teams; LMS Moodle, JetBrains IDEA, Postgres.
Reading list	Basic Literature:
	 9. Paul Deitel. Java How to Program : Early Objects / D. Paul, D. Harvey 11 ed Harlow : Pearson, 2018 1286 p ISBN 978-1-29222385-8 : 49900,00.004.43 - D 33. 10. Robert C. Martin Series. Clean Architecture : A craftsman's Guide to Software Structure and Design / Robert C. Martin Series Boston : Addison-Wesley.
	2018 404 p ISBN 978-0-13-449416-6 : 23720.00. 004 - M29.
	Supplementary literature:
	1. Brahma Dathan. Object-Oriented Analysis, Design and Implementation: An Integrated Approach / D. Brahma, R. Sarnath 2 ed India : Springer, 2015 471 p ISBN 9783319242781 : 31500.00
	2. Bruce Eckel.Thinking in Java / E. Bruce 4 ed USA : MindView, 2006 1482 p ISBN 978-0-13-187248-6 : 27300.00.004 E38.

Module name:	Calculus 1									
Code										
Trimester	3	3								
Person	Prof. B.Muka	nova, Dr.P	hys-Math. Sci							
responsible										
for the module										
Lecturer(s)	B.Mukanova									
Language	English	English								
Relation to	Bachelor prog	Bachelor programmes:								
curriculum	6B06101 Con	6B06101 Computer Science								
	6B06102 Soft	6B06102 Software Engineering								
	6B06103 Big Data Analysis									
	6B04101 IT Management									
	Compulsory	course.								
Type of teaching	Lectures serv	ve to introdu	ice new conce	pts and p	orovide	theoretical and	d methodological			
	foundations.									
	Practice sess	sions (semi	nars) are act	ive sessi	ions to	develop stud	ent's confidence			
	through new e	examples a	nd discussions	s on the j	proble	ms.				
	Instructor-su	ipervised i	ndependent s	tudy (IS	SIS) de	als with review	v and exploration			
	in greater dep	th of the co	ourse material.	G 16 /	ı					
	Student's inc	lependent	study (SIS): 11	Self-stuc	ly time	e including the	time required to			
Workload of	prepare for an	ia complete	e all course as	sessmen	lS.					
workioad of	ECTS	Cont	act hours	1616	SIC	Total hours	1			
components and	credits	Lecture	Dractice	1515	515	Total nours				
credits per	creatis	s	ractice							
trimester	5	30	20	10	90	150				
		50	20	10	,,,	100	1			

3d term

assessment and forms examinationPeriodAssessment typeNumber of pointsExam FormSchedule (Week #) 1^{st} attestation 1^{st} attestationProblem Sets40Submission of written reportsWeekly $Quiz$ 20 written or online test 4^{th} week 20 written reports 4^{th} week 1^{st} attestation 100 total 4^{th} week $2nd$ attestation 100 total 100 written reports $2nd$ attestation 100 total 100 written or online test $2nd$ attestation 100 total 100 written are ports $2nd$ attestation 100 total 100 written are ports $2nd$ attestation 100 total 100 written are ports $2nd$ attestation 100 total 100 written $2nd$ attestation 100 total 100 written $2nd$ attestation 100 total 100 written $2nd$ attestation 100 written $2nd$ attestation $2nd$ <b< th=""></b<>
forms examinationof typeof pointsImm roum of points(Week #)1st attestationProblem Sets40Submission of WeeklyQuiz20written or online test4th weekMid-term Exam40Written5th week2nd attestationProblem Sets40Submission of test2nd
examination1st attestationProblem Sets40Submission of Weekly 1^{st} attestationProblem Sets40Written reportsWeeklyQuiz20written or online test4th weekMid-term Exam40Written5th week 1^{st} attestation100Weekly $2nd$
IterationIterationIterationSubmission of written reportsWeekly $attestation$ Quiz20written or online test 4^{th} week $Mid-term Exam40Written5^{th} week1^{st} attestationtotal1001002ndattestationProblem Sets40Submission ofwritten reportsQuiz20Written oronline test9^{th} weekQuiz20Written oronline test9^{th} weekQuiz20Written oronline test9^{th} weekQuiz100Written10^{th} week2^{nd} attestationtotal100100100Final Exam100WrittenDuring finalexam sessionCumulative total for the course =0.3 * 1^{st} Att + 0.3 * 2^{nd} Att + 0.4 * Final = 100$
AttestationQuiz20written reportsQuiz20written or online test4th weekMid-term Exam40Written5th week1st attestation total1002nd attestationProblem Sets40Submission of written reportsQuiz20Written or online test9th weekQuiz20Written or online test9th weekQuiz20Written or online test9th weekEnd-term Exam40Written10th weekInd total100Final Exam100WrittenDuring final exam sessionCumulative total for the course = $0.3 * 1^{st}$ Att + $0.3 * 2^{nd}$ Att + $0.4*$ Final = 100
Quiz20Written of online 4^{m} WeekMid-term Exam40Written 5^{th} week 1^{st} attestation100total2ndattestationProblem Sets40Quiz20Written orQuiz20Written or9 th weekend-term Exam40Written10 th week2 nd attestation100total100Final Exam100WrittenDuring final exam sessionCumulative total for the course = 0.3 * 1 st Att + 0.3 * 2 nd Att + 0.4*Final = 100
Mid-term Exam40Written 5^{th} week 1^{st} attestation total1001002nd attestationProblem Sets40Submission of written reportsQuiz End-term Exam20Written or online test 9^{th} week 2^{nd} attestation total100100Final Exam100WrittenDuring final exam sessionCumulative total for the course =0.3 * 1 st Att + 0.3 * 2 nd Att + 0.4*Final = 100
Mid-term Exam40Written 5^{th} week 1^{st} attestation total1001002nd attestationProblem Sets40Submission of written reportsQuiz20Written or online test 9^{th} weekEnd-term Exam40Written 10^{th} week 2^{nd} attestation total100100Final Exam100WrittenDuring final exam sessionCumulative total for the course = $0.3 * 1^{st}$ Att + $0.3 * 2^{nd}$ Att + $0.4*$ Final =100
1^{st} attestation total 100 u $2nd$ attestationProblem Sets 40 Submission of written reports $Quiz$ 20 Written or online test 9^{th} week $Quiz$ 20 Written or online test 9^{th} week End -term Exam 40 Written 10^{th} week 2^{nd} attestation total 100 Written 10^{th} weekFinal Exam 100 WrittenDuring final exam sessionCumulative total for the course = $0.3 * 1^{st}$ Att + $0.3 * 2^{nd}$ Att + $0.4*$ Final = 100
totaltotalWeekly2nd attestationProblem Sets40Submission of written reportsWeeklyQuiz20Written or online test9th weekEnd-term Exam40Written10th week2nd attestation total100Image: comparison of totalImage: comparison of totalFinal Exam100WrittenDuring final exam sessionCumulative total for the course =0.3 * 1st Att + 0.3 * 2nd Att + 0.4*Final = 100
$2nd$ attestationProblem Sets 40 Submission of written reportsWeekly $Quiz$ 20 Written or online test 9^{th} week End -term Exam 40 Written 10^{th} week 2^{nd} attestation total 100 100 Final Exam 100 WrittenDuring final exam sessionCumulative total for the course = $0.3 * 1^{st}$ Att + $0.3 * 2^{nd}$ Att + $0.4*$ Final = 100
attestationIteration betaIteration betaIteration betaIteration betaQuiz20Written or online test9th weekEnd-term Exam40Written10th week 2^{nd} attestation total100100Final Exam100WrittenDuring final exam sessionCumulative total for the course = 0.3 * 1st Att + 0.3 * 2nd Att + 0.4*Final = 100
Quiz20Written reportsQuiz20Written or online testEnd-term Exam40Written 2^{nd} attestation total100Final Exam100WrittenCumulative total for the course = 0.3 * 1st Att + 0.3 * 2nd Att + 0.4*Final = 100
Quiz20Written of online test9 weekEnd-term Exam40Written 10^{th} week 2^{nd} attestation total100 100 Final Exam100WrittenDuring final exam sessionCumulative total for the course = 0.3 * 1st Att + 0.3 * 2nd Att + 0.4*Final = 100
End-term Exam40Written 10^{th} week 2^{nd} attestation total 100 100 100 Final Exam 100 WrittenDuring final exam sessionCumulative total for the course = $0.3 * 1^{st}$ Att + $0.3 * 2^{nd}$ Att + $0.4*$ Final = 100
End-term Exam40Written 10^{th} week 2^{nd} attestation total 100 100 Final Exam 100 WrittenDuring final exam sessionCumulative total for the course = $0.3 * 1^{st}$ Att + $0.3 * 2^{nd}$ Att + $0.4*$ Final = 100
2^{nd} attestation total100Final Exam100WrittenDuring final exam sessionCumulative total for the course = 0.3 * 1st Att + 0.3 * 2nd Att + 0.4*Final = 100
2^{nd} attestation total100Final Exam100WrittenDuring final exam sessionCumulative total for the course = 0.3 * 1st Att + 0.3 * 2nd Att + 0.4*Final = 100
total During final Final Exam 100 Written Written Cumulative total for the course = 0.3 * 1 st Att + 0.3 * 2 nd Att + 0.4*Final = 100
Final Exam100WrittenDuring final exam sessionCumulative total for the course = $0.3 * 1^{st}$ Att + $0.3 * 2^{nd}$ Att + $0.4*$ Final = 100
exam session
Cumulative total for the course = 0.3×1^{st} Att + 0.3×2^{nd} Att + $0.4 \times Final = 100$
Cumulative total for the course = 0.3×1^{st} Att + 0.3×2^{nd} Att + $0.4 \times Final = 100$
Requirements Course and university policies include:
according to the Attendance is mandatemy. Missing 200(of largeng will usgult in E (Eail)
Attendance is mandatory. Wissing 50% of lessons will result in F (Fall)
grade (or summer school).
Late submissions are not accepted.
No cheating, duplication, falsification of data, plagiarism, and crib
Contacting the Lecturer : students are welcome to arrange one-to-one
meetings with the teacher during office hours to discuss the class
incentings with the teacher during office hours to discuss the class.
December de de Cecer derre este les Methemeties course
Recommended Secondary scholar Mathematics course.
prerequisites
Module
objectives/inten By the end of this course students will attain the following learning outcomes.
ded learning The student will show a working knowledge in:
outcomes • Limits of sequences and their properties
• Continuity and properties of continuous functions
Derivatives and their applications in extremuma problems
• Antideriver and methods to evaluate them
• Antiderivatives and methods to evaluate them
• Definite integrals in 1D and 2D cases
Gradient and its properties
Improper integrals
Students will have the skill to
• Use both the limit definition and rules of differentiation to differentiat
functions
Skatch the granh of a function using accumutates, antical points, the derivative
• Sketch the graph of a function using asymptotes, critical points, the derivativ
test for increasing/decreasing functions, and concavity.
• Apply differentiation to solve applied max/min problems.
• Evaluate integrals both by using the Fundamental Theorem of Calculus.
• Evaluate integrals using advanced techniques of integration, such a
• Evaluate integrals using advanced techniques of integration, such a substitutions and integration by parts.

	• Apply integration to compute arc lengths, volumes of revolution and surface
	areas.
	• Determine convergence/divergence of improper integrals and evaluate
	convergent improper integrals.
	• Compute the gradient of the multidimensional function.
	• Evaluate elementary double integrals and apply them to compute areas and
	volumes.
	In terms of Competences, students will be able
	• to understand concepts related to limits, continuity, derivatives and basic
	integrals;
	• to understand concepts of multidimensional functions, partial derivatives,
	gradient, double and multidimensional integrals;
	• to work with these concepts numerically, graphically and analytically;
	• to apply above-mentioned tools to problems in postrequisites courses;
Content	The course covers differentiation and integration of functions of one variable and
	basic concepts of multidimensional Calculus, with applications.
Media	University is equipped with Multimedia Studio to prepare the online content of the
employed	lectures. Multimedia classrooms equipped with computer, projection and audio
1 2	system; Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	Basic Literature:
8	1 Thomas' Calculus By George b Thomas revised by I Hass C Heil M D Weir
	Pearson Publishing Company 14n edition
	2 George h Thomas Ir Ross I Finney Calculus and Analytic Geometry Part II
	Addison-Wesley Publishing Company 9 th edition
	Sunnlamentary literature:
	2 G. N. Berman, A collection of problems on a course of Mathematical Analysis
	5.0.1 N. Derman, A concernor of problems on a course of Mathematical Analysis
	τ . г. ин. Филтеннольц. Основы математического анализа, г. г., изд-е 9-ос, изд. Пону 2009 449 о
	Лань – 2000. – 440 С. 5. Ибланиар VII. Елистикар III Т. Матаматика аналик станка. Алистика
	5. порашев л.н., Еркетұлов ш.т. математикалық анализ курсы Алматы,
	6. 1емирғалиев Н.1. Математикалық анализ. 1 оөлім Алматы: Мектеп, 1987.

Module name:	Web Technologies (Backend)
Code	
Trimester	3
Person	Zhantileuov Eldiyar M.Sc.
responsible	
for the module	
Lecturer(s)	Bakhytzhan Beisembiyev, MSc
	Gulnara Abitova, PhD
	Yelaman Apushev, MS,
	Yerlan Orakbayev, MS
Language	English
Relation to	Bachelor programmes: Big Data Analysis, Software Engineering, IT Management.
curriculum	(Programmes under accreditation are listed)
	Compulsory course.
T. C. 1	
Type of teaching	Lectures serve to introduce new concepts and provide theoretical and methodological
	foundations.
	Practice sessions (seminars) are active sessions to develop student's confidence
	through new examples and discussions on the problems.
	Instructor-supervised independent study (ISIS) deals with review and exploration
	in greater depth of the course material.

	Student's independent study (SIS): Self-study time including the time required to prepare for and complete all course assessments													
Workload of				100 400	essiner	105.								
course	ECTS	Cont	act hou	rs	ISIS	SIS	Total hou	irs						
components and	credits	Lecture	ce	1										
credits per		S	ns											
trimester	5	30	2	0	10	90 150								
				-										
Course														
assessment and	Period	Assessme	nt	Num	ber	Exam	Form	Schedule						
forms of		type		of po	ints			(Week #)						
examination	1 st	Assignment 1 20		20		Mini P	roject	2 nd week						
	attestation	n Assignment 2 20		Mini P	roject	3 rd week								
		Assignme	ent 3	20		Mini P	roject	4 th week						
		Mid-term Exam 40		Coding	g	5 th week								
					Challe	nge								
		1 st attesta	tion	100										
		total												
	2nd	Assignme	ent l	20	Mini P		roject	7 th week						
	attestation	Assignment 2		20		Mini Project		8 th week						
		Assignment 3		20		Mini Project		9 th week						
		End-term Exam		40		Written		10 th week						
		2 nd attestation		100		Codine	τ							
		total	100		Challe	5 nge								
	Final Projec	t	100		Demonstration		During final							
	5						exam session							
	Cumulative	umulative total for the course = $0.3 * 1^{st} Att + 0.3 * 2^{nd} Att + 0.4*Final = 100$.												
Requirements	Course and	universit	y polic	ies inc	lude:									
according to the	A 44	·	N	л·	200/	. 6 1								
examination	Attendance	is manda	tory. IV	lissing	5 30% 0	of less	sons will r	esult in F (Fall)						
regulations	grade (or su	ımmer sch	100l).											
	Late submis	sions are n	ot acce	pted.										
	No cheating	. duplicat	ion. fa	lsificat	tion o	f data.	plagiaris	m. and crib						
	Contacting	the Leature	non at	idanta	0 ** 0 11/	alaama	to orrong	o ana ta ana						
	meetings wi	the Lecture th the teacl	her dur	ing off	ice ho	ours to	discuss the	e class.						
Recommended	Basic program	nming Wel	n Techn	ologies	1 (Fro	nt-Fnd) Database	•s						
prerequisites	Busic program			Sidgles	1 (11)	/m-Liiu	, Databast	.0						
Module														
objectives/inten	By the end of	this course	studen	ts will a	attain t	he follo	wing learn	ing outcomes.						
ded learning	The student	will show a	ı worki	ng kno	wledg	e in:	0	<u> </u>						
outcomes	• To a	create, deb	ug, an	d mair	ntain o	dynamic	e websites	and use gathered						
	knowledge of	f creating dy	ynamic	web sit	es with	h chose	n framewor	rk and database;						
	• To u	se different	APIs, te	o write	own R	ESTfU	I API;							
	• To d	eploy web a	applicat	ion;				 To deploy web application; 						

	 To manage and present information to support making a business- critical decision; To interact, collaborate and communicate effectively with your instructor and fellow students; Students will have the skill to Understanding of back-end development; Good knowledge in web development including understanding of MVC, chosen framework, SQL/NoSQL, HTML, CSS and JavaScript or other programming languages and backend tools and technologies;
Content	 In terms of Competences, students will be able to Installing development environment of creating website on chosen framework; Interact web application with SQL/NoSQL as well as with front- end; Create a database application; Learn how to secure code; Deliver short, easy presentations and documents that are well considered, compelling and supported by evidence; Research and evaluate information; Present findings in an organized and compelling manner; Discuss the notion that every problem has multiple solutions, each with its own advantages and disadvantages, and that success is tied to findirig the technical solution that best fits into the non-technical dimensions of a specific problem. "WEB 'fechnologies 2 (Back End)" is a 10-week course and it provides the knowledge to design and develop dynamic, database-driven web applications. This collrse covers in depth the most important techniques widely used by web developers. Students learn how to connect to database and perform practices with tile database to create database-driven forms both with SQL and NoSQL databases. Also, course includes knowledge to gain skills including work with APIs, building RESTful APIs, deployment and modern security coucepts'
Media employed	Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	Basic Literature:1.Web Development with Node and Express: Leveraging the .IavaScript Stackby Ethan Brown - Published by O'Reilly Media, Inc.,2019.2.Beginning Nodejs, Express & MongoDB Development by Greg, Lim.20193.JavaScript & jQuery. The Missing Manual by David Sawyer McFarlandPublished by O'Reilly Media, Inc., 2015.

Module name:	Coding Lab						
Code							
Trimester	3						
Person	Aimukhambetov O. Senior lecturer						
responsible							
for the module							
Lecturer(s)	Aimukhambetov, Kuatbayeva A., Nurgazy M.						
Language	English						
Deletion to	(D0(101 %C)			2 "0-0	T		
------------------	---	--	---------------------------------	-------------------	-----------	-----------------	---------------------
Kelation to	oboolol Computer Science, oboolo2 Software Engineering						
curriculum							
Type of teaching	Lectures serve to introduce new concepts and provide theoretical and methodological						
	foundations.						
	Practice sess	ions (semi	i nars) are activ	ve sess	ions to	o develop stud	ent's confidence
	through new e	examples a	nd discussions	on the	problei	ns.	
	Instructor-su	pervised i	ndependent st	udy (IS	SIS) de	als with reviev	v and exploration
	in greater dep	th of the co	ourse material.	•	ŕ		-
	Student's inc	lependent	study (SIS): S	elf-stuc	ly time	e including the	time required to
	prepare for an	d complete	all course asse	essment	ts.	e	1
Workload of		1			-		
course	FCTS	Cont	act hours	ISIS	SIS	Total hours	1
components and	aradita	Lactura	Dractico	1515	515	10tal liburs	
components and	creatis	Lecture	Practice				
trimenter		s 20	sessions	10	0.0	150	
trimester	5	30	20	10	90	150	J
Course							
assessment and	Period		Milest	tones co	omplia	nce	Number of
forms of							points
examination	1 st Attestatio	n 1.	Project Pro	posal			20
		2.	Project Pla	an (sch	nedule	graph must	be 20
		incl	uded)				
		3.	Milestone	1			20
		4.	Milestone	2			20
		5.	Milestone	3			20
	2 nd Attestatio	on 1.	Milestone 4	4			20
		2	Milestone	5			20
		2.	Milestone	6			20
		5. 4	Milestone	7			20
		-+. 5	Milestone	' 8 (Mus	t inclu	ide at least 60	20 % 20
		J.	vorking project	0 (1 111 2	st mere	ide at least 00	/0 20
	Final ayom	Dr.	orking project)			25
	Tillal CXalli	- 110	esciliation	an ant			25
		- DC		epon			23 50
	Total	- 10	$\star \Delta ttostation \perp$	0 /*E:	aa1		30
Deminente	Commence	$\frac{101}{101} 0,0^{-r} \text{Attestation} + 0,4^{r} \text{Final}$					
Requirements	Course and	universit	y policies incl	lude:			
according to the	Attendence	ia manda	tory Missing	300/	of loss	one will resu	lt in F (Fail)
evamination	Attenuance	is manua	tory. Wiissing	50 /0	01 1055	ons will i csu	nt m r (ran)
regulations	grade (or su	mmer sch	100D.				
regulations	grade (or su		1001)0				
	Late submiss	sions are n	ot accepted.				
	No cheating	, duplicat	ion, falsificat	tion of	data,	plagiarism,	and crib
	Contacting	tha Lactu	ror: students	are we	lcome	to arrange or	e_to_one
	Contacting						
	meetings wit	in the teac	ner during off	ice not	irs to	discuss the cl	ass.
Recommended	"Introduction	to Program	ming" "Web t	echnol	ories"		
prerequisites	"Object Orier	ted Program	mming, web	duction	$t_0 D_2$	tabases"	
Module		illeu i iogia	mining, millo	auction		allabases	
objectives/inter	By the and of	this course	atudanta will -	ttoin +1	a fall-	wing loomin -	outcomes
ded learning	The standard	uns course	students will a	utam th	ic 10110	wing learning	outcomes.
ded learning	i ne student	WIII SNOW 8	i working kno	wiedge	ш: 		· · · 1 · · · · · 1
outcomes	• Comr	nunication	- Students car	n expre	ss thei	r ideas clearly	and effectively,
	both verbally	and in writ	ten form.				

	Collaboration - Students can work as a team to achieve common goals
	 Knowledge application Students can make links across different areas of
	• Knowledge application - Students can make miks across unrefer areas of
	knowledge and to generate, develop and evaluate ideas and information related to the
	project.
	• Independent learning - Students can learn on their own, reflect on their
	learning and improve upon it.
	• Students should understand and discriminate the strengths and weaknesses of
	scheduling policies, interposes communication methods and memory management
	issues in timesharing systems.
	• Students should evaluate the relevant issues that will enable them to make
	informed judgments about computer information protection and security.
	• Having identified the key problems and issues of processing in a
	multiprocessing environment, students will develop a more efficient and effective
	software writing style
	• Students should be able to recognize describe find and retrieve the
	• Students should be able to recognize, describe, find and retrieve the
	professional information from their project works.
	• Use repetition in logo to create algorithms.
	• Create simple programs in scratch 2 with a clear goal.
	• Can debug basic code
	• Predict the behavior of programs
	Students will have the skill to
	• Create sequences of instructions
	• Recognise patterns in code
	• Use software to create basic programs.
	• Debug simple programs by using logical reasoning to predict the actions
	instructed by the code.
	• Understand that programs execute by following precise and unambiguous
	instruction.
	In terms of competences, students will be able to
	• Critically evaluate the data and information:
	• Learn to express their creativity using coding and technology
	making exciting personal ideas come to life through coding (this serves as
	the prime motivator for students to learn play and push their coding skills further
	every day)
	lower to viewalize a measure that accountlishes a task in their maint
	• learn to visualize a process that accomplishes a task in their project
	• reflect on their thinking and learning to transfer to new challenges
	• excite about learning and exploring coding and technologies on their 'own
	time'
Content	This course will introduce project design and implementation and where the main
	idea is to give to students the practical knowledge of programming and the
	opportunity to make real projects.
	During this course, each group of students is allocated active hours with teachers to
	discuss about their projects and their achievements. The objective of this course is to
	introduce students to the fundamentals of computer programming, programming
	language and problem solving. It is designed as the first course for computer science
	majors. The emphasis is on the fundamentals concepts of computer science, including
	structured and object-oriented programming, syntax, semantics, testing/debugging,
	implementation, documentation, and recursion using the any programming language.
	Students will be exposed to development on using text editing and programming
	skills.
Media	Multimedia classrooms equipped with computer, projection and audio system;
employed	Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	Basic Literature:

1. Walpole, Myers, Myers, Ye. Probability and Statistics for Engineers and
Scientists. 9th edition. 2016, Pearson.
2. Sheldon Ross. Introduction to Probability and Statistics for Engineers and
Scientists. 5th edition. 2014, Elsevier.
3. Sheldon Ross. First Course in Probability. 10th edition. 2019, Pearson
Education.
Supplementary literature:
1. L. Wasserman. All of Statistics. Springer, 2005
2. Lange, Applied Probability. Springer, 2015
3. Jobson: Applied Muhivariate Data Analysis, Volume I: Regression and
Experimental Design.

Module name:	Innovation Lab						
Code							
Trimester	3						
Person	Aimukhambetov	O. Se	enior lecturer				
responsible							
for the module							
L s stansor(s)	A	17		M			
Lecturer(s)	Aimuknambetov,	Kuatba	ayeva A., Nurga	azy M.			
Language	English						
Relation to	6B06101 "Comp	uter S	cience", 6B06	5102 "\$	Softwa	are Engineering	g"
curriculum							
Type of teaching	Lectures serve to foundations	introdu	ice new concept	ts and p	orovide	theoretical and	methodological
	Practice sessions	(semi	nars) are activ	ze sessi	ions to	develop studer	nt's confidence
	through new exam	ples a	nd discussions	on the p	orobler	ns.	
	Instructor-superv	vised i	ndependent st	udy (IŚ	SIS) de	als with review a	and exploration
	in greater depth of	the co	ourse material.	• •	ŕ		-
	Student's indepen	ndent	study (SIS): S	elf-stuc	ly time	e including the t	ime required to
	prepare for and co	mplete	e all course asse	essment	ts.		
Workload of		~					
course	ECTS	Cont	act hours	ISIS	SIS	Total hours	
components and	credits Leo	ctures	Practice				
trimester	5	30	20	10	90	150	
timester	5	30	20	10	90	150	
Course							
assessment and	Period		Milest	ones co	omplia	ance	Number of
forms of							points
examination	1 st Attestation	1.	Project Pro	oposal			20
		2.	Project Pla	an (sch	nedule	graph must be	20
		incl	uded)				
		3.	Milestone	1			20
		4.	Milestone	2			20
		5.	Milestone	3			20
	2 nd Attestation	1.	Milestone	4			20
		2.	Milestone	5			20
		3.	Milestone	6			20
		4.	Milestone	7			20
		5.	Milestone	8 (M	lust ir	nclude at least	t 20

		60% of working project)	
		sove of working project)	
	Final exam	- Presentation	25
		- Documentation report	25
		- Project	50
	Total	0,6 * Attestation + 0,4*Final	
Requirements	Course and univ	versity policies include:	
according to the	Attendance is m	andatory. Missing 30% of lessons will result in	ı F (Fail)
examination	grade (or summ	er school).	
regulations	Late submissions	are not accepted.	
	No cheating, du	plication, falsification of data, plagiarism, and	crib
	Contacting the I	Lecturer: students are welcome to arrange one-to	-one
	meetings with the	e teacher during office hours to discuss the class.	
Recommended	"Introduction to l	Programming" "Web technologies"	
prerequisites	"Object Oriented	Programming", "Introduction to Databases"	
Module			
objectives/inten	By the end of this	course students will attain the following learning outco	omes.
ded learning	The student will s	how a working knowledge in:	
outcomes	• Generate i	dea - Students should identify a problem and solution	on, in which
	area it can be impo	ortant.	
	• Building a	a business plan - information on selected industry,	operations,
	finances and a mar	ket analysis should be included.	offootivolv
	both verbally and i	n written form	effectively,
	Collaborat	ion - Students can work as a team to achieve common	goals.
	• Independe	nt learning - Students can learn on their own, refle	ect on their
	learning and impro	ove upon it.	
	Students sl	nould understand and discriminate the strengths and we	eaknesses of
	scheduling policie	s, interposes communication methods and memory r	nanagement
	1ssues in timeshari	ng systems.	
	• Build a cus	stomer base, who will use the product.	
	Students will have	e the skill to	
	Create pres	sentation of idea or product	
	Create tem	plates on Figma	
	• Use softwa	are to create basic programs.	
	• Debug sin	iple programs by using logical reasoning to predict	the actions
	Instructed by the contract the pr	ode.	
	• Test the pr	oddet to find out some disadvantages of add features.	
	In terms of compo	etences, students will be able to	
	• Critically e	evaluate the data and information;	
	• Learn to ex	spress their creativity using presentation skills.	
	• making ex	citing, personal ideas come to life through coding (this	s serves as
	every day)	in for students to rearri, pray and push their coding skill	15 Iuruler
	• work in tes	am and delegate tasks	
	learn to vis	sualize a process that accomplishes a task in their proj	ect
	• test own pr	roduct with assess of some group of users	
Content	This course will in	ntroduce project design and implementation and whe	re the main
	idea is to know how	w to start new projects and the opportunity to make th	em real.

Media employed Reading list	 During this course, each group of students is allocated active hours with teachers to discuss about their projects and their achievements. The objective of this course is to introduce students to the fundamentals of computer programming, programming language and problem solving. It is designed as the first course for computer science majors. The emphasis is on the fundamentals concepts of computer science, including structured and object-oriented programming, syntax, semantics, testing/debugging, implementation, documentation, and recursion using the any programming language. Students will be exposed to development on using text editing and programming skills. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Basic Literature: Walpole, Myers, Myers, Ye. Probability and Statistics for Engineers and Scientists. 9th edition. 2016, Pearson. Sheldon Ross. Introduction to Probability and Statistics for Engineers and Scientists. 5th edition. 2014, Elsevier. Sheldon Ross. First Course in Probability. 10th edition. 2019, Pearson Education. 							
Modulo nome:	 L. Wasserman. All of Statistics. Springer, 2005 Lange, Applied Probability. Springer, 2015 Jobson: Applied Muhivariate Data Analysis, Volume I: Regression and Experimental Design. 						sion and	
Module name.	Algorithms a	nu Data S	tructures					
Code								
Trimester Derson	3 Sonior locture	n Aigonim	Aibathals M	Sa				
responsible for the module Lecturer(s)	A.Aibatbek, N	A Aibethelt M Se. A Kyzyrkeney M Se. N. Kerimehen MSIT. C. Mussing M Se.						
	,	,		,			,	
Language	English							
Relation to curriculum	Bachelor prog Compulsory c	Bachelor programs: Computer Science, Smart Technologies. Compulsory course.						
Type of teaching	Lectures serv	e to introdu	ace new conc	epts and pro	ovide t	heoret	cal and method	dological
	foundations.	iona ('	nov e)	line	ma +-	da1	a atu 1	nfid-n
	through new e	examples a	mars) are of nd discussion	nne sessio ns on the pr	nis to oblem	uevelo s.	p student's co	midence
	Lab Sessions are offline sessions where a topic is reinforced with additional exercises							
	and quizzes.				~			
	Instructor-su	pervised i	ndependent	study (ISI)	S) dea	ls with	review and ex	ploration
	Student's ind	lependent	study (SIS)	: Self-study	time	includi	ng the time re	quired to
	prepare for an	d complete	e all course a	ssignments	•		-	-
Workload of	DOTO		<u> </u>		ICI	CTC	m . 11	۱ I
course	ECTS	Lecture	Contact hour	S	ISI C	SIS	Total hours	
credits per		S	sessions	sessions	0			
trimester								
	5	20	10	20	10	90	150	

Course							
assessment and	Period	Assessment	Number	Exam Form	Schedule		
forms of		type	of points		(Week #)		
examination	1 st	Assignments:	40	Submission of	Weekly		
	attestation	Assignment 1,		code answers			
		Assignment 2					
		Quiz 1	20	Multiple Choice	3 rd week		
				questions and			
			10	practical task	ath a		
		Mid-term Exam	40	Multiple Choice	5 th week		
				Questions and			
		1 st attastation	100				
		total	100				
	2nd	Assignments:	40	Submission of	Weekly		
	attestation	Assignment 3,	20	code answers	,		
		Assignment 4	20				
		Quiz 2	20	Multiple Choice	8 th week		
				Questions and			
				practical task			
		End-term Exam	40	Multiple Choice	10 th week		
				Questions and			
		and the training	100	practical task			
		2 nd attestation	100				
	Final Exam	totai	100	Multiple Choice	During final		
			100	Questions	exam session		
	Cumulative total for the course = $0.3 * 1^{st} Att + 0.3 * 2^{nd} Att + 0.4 * F$						
Requirements according to the examination	Course and Attendance grade (or su	university polic is mandatory. N ummer school)	ies include Aissing 30%	: % of lessons will r	esult in F (Fail)		
regulations	Late submis	sions are not acce	ented				
	No cheating	, duplication, fa	pica. Isification (of data, plagiarisi	n. and crib		
	Contacting	the Lecturer: stu	idents are w	velcome to arrange	e one-to-one		
	meetings wi	th the teacher dur	ing office h	ours to discuss the	e class.		
	8		6				
Recommended prerequisites	"Introduction	to programming C	2++", "Objec	t-oriented programm	ning (Java)"		
Module							
objectives/inten	By the end of	this course studen	ts will attain	the following learns	ing outcomes.		
ded learning	The student	will be able to:					
outcomes	 Choose appropriate algorithms and data structures for storing data, searching and sorting, as well as implementing those algorithms. Analyze the runtime performance of various algorithms and programs in full statements. 						
	terms of the s	size of their inputs,	averages, be	si, and worst cases.			
	Students wil	I have the skill to					
		onceptualize man	y programm	ing issues at a hi	igher level through		
		iu uaia structures;	oun of basis	data structures.			
		now the tradeoffs	of each stud	uaia su uciures; lied data structure (so as to employ the		
	appropriate one for a given situation:						

	• To improve understanding of recursive methods:
	To analyze data structures and their algorithms for asymptotic behavior
	• To analyze data structures and then algorithms for asymptotic behavior.
	In terms of competences, students will have:
	• Sound knowledge in various algorithms and data structures:
	 Knowledge of complexity theory basics
Content	"Algorithms and Data Structures" is a 10 week course, where the main focus is
Content	designed on solving computational problems that involve collections of data
	Students will study a core set of data abstractions data structures, and algorithms that
	provide a foundation for creating and maintaining afficient programs and algorithms
	in particular, and software in general
	Topics include: recursion, asymptotic analysis and Pig O notation; physical data
	structures: array linked list: logical data structures: hash tables tree: sorting
	algorithms: hubble sort merge sort quick sort; searching algorithms: linear and
	hipperv search: graph: searching algorithms: BES and DES: dynamic programming
Madia	Classrooms again and with computer projection whiteheard. Microsoft teems
amplayed	LMS Moodle Learn Astane IT platform
employed	LMS Woodle, Learn Astana 11 platorni.
Reading list	Rosic Litaroturo.
Redding list	11 Lecture notes (available on moodle astanait edu kz):
	12 Brian Christian Algorithms To Live By: The Computer Science of Human
	Decision / C Brian G Tom - Great Britain: William Collins 2017 - 351 n - ISBN
	9780007547999 · 12900 00 392 - C 56 :
	13 Thomas H. Cormen. Introduction to Algorithms. The MIT Press. 4th Edition
	2022
	Supplementary literature:
	3. Aditya Y. Bhargaya - Grokking Algorithms: An Illustrated Guide for
	Programmers and Other Curious People, Manning: 1st edition (May 1, 2016):
	4. Loiane Groner, Learning JavaScript Data Structures and Algorithms 2014

Module name:	The Kazakh Language (B2)
Code	K(R)Ya 1104 K(R) Ya 2105
Trimester	4
Person	Assoc. Prof. G.Kamiyeva, PhD
responsible	Assoc. Prof. B. Dinayeva, PhD
for the module	Assoc. Prof. S. Sapina, PhD
Lecturer(s)	G.Kamiyeva,
	B.Dinayeva,
	S.Sapina
Language	Kazakh language
Relation to	Bachelor programmes: Computer Science, Software Engineering, Big Data Analysis,
curriculum	Industrial Automation, Media Technologies, Cyber Security, Telecommunication
	Systems, IT Management, Digital Journalism.
	Compulsory course.
Type of teaching	Practice sessions (seminars) are active sessions to develop student's confidence
	through new examples and discussions on the problems.
	Instructor-supervised independent study (ISIS) deals with review and exploration
	in greater depth of the course material.
	Student's independent study (SIS): Self-study time including the time required to
	prepare for and complete all course assessments.
Workload of	

4th term

course	ECTS	Contact hou	rs	ISIS	SIS	Total hou	rs
components and	credits	Practice sessions					
credits per	5	50		50	50	150	
trimester							
Course	Derried	Aggaggmant	Numi		Evan	Farma	Sahadula
forms of	Period	Assessment	Nume	into	Exam	Form	(Week #)
examination	1 st	Problem Sets	30		Submi	ssion of	Weekly
•nummuron	attestation	1 Toblem Sets	50		writter	reports	Weekiy
		Quiz	30		Writte	n	3 rd week
		Mid-term Exam	40		Writte	n	4 th week
		1 st attestation	100				
		total					
	2nd attestation	Problem Sets	30		Submi	ssion of	Weekly
	uttestation	Quiz	30		Writte	n	7 th week
		End-term Exam	40		Writte	n	9 th week
		2 nd attestation	100				
	Einel Exem	total	100		Writta		Duning fingl
	Final Exam		100		written		exam session
							exam session
	Cumulative	total for the course	e = 0,3	* 1 st A	tt + 0,3	* 2 nd Att +	0,4*Final = 100.
Requirements	Course and	university polic	ies inc	lude:	61	••••	
according to the	Attendance	is mandatory. N	lissing	g 30%	of less	sons will r	esult in F (Fail)
regulations	grade (or su	immer school).	4 . 1				
	Late submis	sions are not acce	pied.	tion of	data	nlagiania	m and arih
	No cheating, duplication, falsification of data, plagiarism, and crib Contacting the Lecturer: students are welcome to arrange one-to-one meetings with the teacher during office hours to discuss the class.						
Recommended	B1 level of the Kazakh language						
prerequisites		6 6					
· ·							
Module	By the end of	f this course studen	ts will a	attain t	he follo	wing learning	ing outcomes.
objectives/inten	The student	will show a worki	ng kno	wledge	e in:		
ded learning	• the s	yntaxes of the gene	eral Kaz	zakh la	nguage	in speakin	g, reading, listening
outcomes	and writing;	· 1 1	1		·		
	• tunctional language for general communication,						
	 rules of word building. Students will have the skill to 						
	determine the specific vocabulary related to the tonic and use it in everyday.						
	life	speeme (- ,			
	• use words, phrases and grammatical structures appropriately						ıtely
	• read	the text fluently					
	• interp	pret information give	ven in to	exts			
	• use th	ne syntax rules in th	ne Kaza	kh lan	guage		
	In terms of (ompetences, stud	lents w	ill be a	ble to		
	• under	rstand the content of	ot vario	us type	s of tex	tts	
	• ask and answer questions in various situations						

	 write dictation according to KAZTEST requirements compose texts in a written form
Content	The subject "Kazakh language" is intended for students at the B2 level. Practical Kazakh language is intended for teaching the Kazakh language to students of Russian departments. The curriculum of the Kazakh language is based on the latest linguistic and methodological achievements of the teaching of the Kazakh language. The educational-methodological complex is based on a modular training system. The proposed program takes into account the educational levels of students, the purpose, value and positions of the lesson, types of speaking activities; It consists of content that meets the requirements of listening, speaking, writing.
Media employed	Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle.
Des l'as l'at	
	 Zhakanova J.R., Igenova A.A. Kazakh language. Advanced Level: Tutorial. Nur- Sultan, 2019 195 p. Abduova B.S., Asanova U.O. Kazakh language: a study tool for Russian-speaking groups Astana, 2017282 p. Balabekov A.K., Bozbaeva-Hung A.T., Dosmambetova G.K., Salykhova B.O., Khazimova A.Zh Kazakh language: textbook for intermediate and advanced level. National testing center Astana: 2017 Kuzekova, Z.S. Functional practical grammar of the Kazakh language: textbook Astana: Foliant, 2015 180 p. Dinaeva B.B., Kamieva G.K. Kazakh language. Educational tool for IT students Astana, 2023 200 p. Supplementary literature: Bainbridge J. Media and journalism: a new approach to theory and practice: textbook [Text]: textbook/ Zh. Bainbridge, N. Gok, L. Tainan Almaty : Davir, 2019 592 p. (100 new textbooks). Ter-Minasova S.G. Language and intercultural communication: textbook [Text]: textbook/ S.G. Ter-Minasova Almaty: National Translation Bureau, 2018 320 p. (100 new textbooks). Dinaeva B.B., Sapina S.M. Theoretical and practical foundations of academic
	 (100 new textbooks). 3. Dinaeva B.B., Sapina S.M. Theoretical and practical foundations of academic literacy. Educational tool. Revised 2nd Edition Nur-Sultan, 2020200 p.

Module name:	Kazakh language (for foreigners). Elementary (A1)
Code	K(R)Ya 1104 K(R) Ya 2105
Trimester	4
Person	Assoc. Prof. B. Dinayeva, PhD
responsible	
for the module	
Lecturer(s)	B. Dinayeva,
Language	Kazakh language
Relation to	Bachelor programmes: Software Engineering, IT Management.
curriculum	Compulsory course.
Type of teaching	Practice sessions Bring students' reading, listening, writing and speaking skills to a
Тип	level where they can understand.
преподавания	Student's independent study (SIS): Self-study time including the time required to
	prepare for and complete all course assessments.
Workload of	

course								
components and	ECTS	Contact hou	rs	ISIS	SIS	Total hour	rs	
credits per	credits	Practice sessions						
trimester	5	50		50	50	150		
Course								
assessment and	Period	Assessment	Schedule					
forms of		type	of poi	nts			(Week #)	
examination	1 st	Problem Sets	30		Submi	ssion of	Weekly	
Оценка курса и	attestation				writter	n reports	2	
формы		Quiz	30		Written		1 rd week	
экзамена		Mid-term Exam	40		Written	n	4 th week	
		1 st attestation	100					
		total						
	2nd	Problem Sets	30		Submi	ssion of	Weekly	
	attestation				writter	n reports		
		Quiz	30		Written	n	7 th week	
		End-term Exam	40		Writter	n	9 th week	
		2 nd attestation	100					
		total						
	Final Exam		100		Written		During final	
							exam session	
	Cumulative	total for the course	e = 0,3	* 1 st A	tt + 0,3	* 2 nd Att +	0,4*Final = 100.	
Dequirements	Course and	······································		land on				
according to the	Course and	in mandatawa		1uue:	of 1000		agult in E (Eail)	
examination	Attendance	is manualory. N	IIssing	30%	of less	sons will r	esuit in F (Faii)	
regulations	grade (or st	immer school).						
	Late submis	sions are not acce	ptea.	•	• • •		1 1	
	No cheating, duplication, falsification of data, plagiarism, and crib Contacting the Lecturer: students are welcome to arrange one-to-one							
	meetings wi	th the teacher dur	ing off	ice ho	urs to o	discuss the	e class.	
D 1.1								
Recommended	Level 0							
prerequisites								
Module								
objectives/inten	By the end of	this course studen	ts will a	ittain tl	he follo	wing learni	ng outcomes	
ded learning	The student	will show a worki	ng knov	wledge	e in:	wing iourni	ing outcomes.	
outcomes	• the c	communicative co	mpeten	ce of	the la	nguage lea	rner based on the	
	"letter/sound-	word-phrase" mod	el:					
	• using	the language patte	rns in v	arious	situatio	ons;		
	• spelli	ng rules, paying a	ttention	to pu	Inctuation	on and read	ding intonation and	
	pausing.			1			-	
	Students wil	l have the skill to						
	• maste	er the sound feature	es and p	ronunc	ciation of	of words;		
	• read	the text fluently.						
	• speak in a short dialogues.							
	-							
	In terms of (competences, stud	ents wi	II be a	ble to			
	• determine the specific vocabulary related to the topic and use it in everyday							

	 life; use words, phrases and grammatical structures appropriately; read according to the orthographic norm of the Kazakh language; write information about him/herself, family, address, etc.; write simple dictation according to KAZTEST requirements.
Content	The subject "Kazakh language" is intended for students at the A1 level. A1 level is studied by foreign students as an initial level, at the end of the course students should learn 1200-1300 words. At the A1 level, students should be able to read texts in the Kazakh language, tell information about themselves, understand and express everyday words. The "Kazakh language" A1 level course teaches the student to use the Kazakh language at a basic level through reading, writing, listening, and pronunciation skills.
Media employed	Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle.
Reading list Список для чтения	 Basic Literature: 1. L. Beysenbaeva, A. Balabekov, A. Zhakypzhanova "Kazakh language" textbook for relatives abroad (A1 - basic level) Nur-Sultan, 2021. 2. N. Dauletkereeva, N. Nurmagambetova, A. Smykova "Kazakh language" textbook for relatives abroad (A1 - basic level) Nur-Sultan, 2021. 3. G.K. Dosmambetova, A.K. Balabekov, A.T. Bozbaeva-Hung, A.D. Seisenova. Kazakh language. Simple level A1. Textbook Astana: National Testing Center, 2016268 p. Supplementary literature: 1. Tileshov E., Turlybekova J., Kayupova N. Let's learn Kazakh Astana: "Rukhaniyat", 2010. 2. Bekturova A.Sh., Bekturov Sh.K. Kazakh language for all Almaty: Atamura, 2004720 p.

Module name:	Russian Language
Code	K(R)Ya 1104
Trimester	4
Person	Assoc. Prof. L.Orazgalieva, candidate of philological sciences
responsible	
for the module	
Lecturer(s)	Zhusupov A.E. –a.zhussupov@astanait.edu.kz, Assoc. Prof., candidate of
	philological sciences
	Orazgalieva L.M. – <u>Laura.Orazgaliyeva@astanait.edu.kz</u> , Assoc. Prof., candidate
	of philological sciences, Assoc. Prof., candidate of philological sciences
	Moldachmetova Z.Nz.moldakhmetova@astanait.edu.kz, Assoc. Prof.,
	candidate of philological sciences
	Shaheen A.A. –a.shaheen@astanait.edu.kz, Assoc. Prof., candidate of philological
	sciences
	Malikova Zh.D. zhanar.malikava@astanait.edu.kz, Assoc. Prof., candidate of
	philological sciences
Language	Russian
Relation to	6B06101 – Computer Science, 6B06102 – Software Engineering, 6B06103 – Big
curriculum	Data Analysis, 6B06104 - Industrial Automation, 6B06105 - Media
	Technologies, 6B06301 - Cyber Security, 6B06201 - Telecommunication
	Systems, 6B04101 – IT Management, 6B06202- Smart Technologies, 6B03201 –
	Digital Journalism, 6B06106 – Mathematical and Computational science.
	Compulsory course.

Type of teaching	Practice sessions (seminars) are active sessions to develop student's confidence through new examples and discussions on the problems.							
	Instructor-supervised independent study (ISIS) deals with review and exploration in greater depth of the course material.							
	Student's ind	udent's independent study (SIS): Self-study time including the time required						
Workload of	to prepare for	and complete all c	course a	ssessn	ients.			
course components	ECTS	Contact hou	Contact hours ISIS SIS Total hours					
and credits per	credits	Practice sessions	10	1515		1 otur n		
trimester	5	50		10	0 90		150	
		ŀ					I	
Course assessment	r	I	1					
and forms of	Period	Assessment	Numb	per	Exam Fo	orm	Schedule	
examination	1 st	type	of poi	nts	<u> </u>	·	(Week #)	
	attestation	Problem Sets	30		Submiss	101 OI	weekiy	
		Ouiz	30		Written	epons	2 rd week	
		Mid-term Exam	40		Written		4 th week	
		1 st attestation	100					
		total	100					
	2nd	Problem Sets	30		Submiss	ion of	Weekly	
	attestation				written reports			
		Quiz	30		Written		8 th week	
		End-term Exam	40		Written		10 th week	
		2 nd attestation	100					
	Final Exam	total	100		Writton		During final	
			100		w much		exam session	
	Cumulative total for the course = $0.3 * 1^{\text{st}} \text{Att} + 0.3 * 2^{\text{nd}} \text{Att} + 0.4 * \text{Final} = 100.$							
Requirements	Course and university policies include:							
according to the	Attendance is mandatory. Missing 30% of lessons will result in F (Fail)							
examination	grade (or summer school).							
regulations	Late submis	sions are not acce	epted.					
	No cheating	, duplication, fa	lsificat	ion of	f data, p	lagiaris	m, and crib	
	Contacting	the Lecturer: stu	idents a	are we	elcome to	o arrang	e one-to-one	
	meetings wi	th the teacher dur	ring off	ïce ho	ours to di	scuss th	e class.	
D 11	<u>C 14 1 4 1</u>	,						
Recommended	Cultural studi	es						
Module	By the end of	this course studen	ts will a	ttain t	he follow	ing learn	ing outcomes	
objectives/intended	The student	will show a worki	ng kno	wledge	e in:	ing lean	ing outcomes.	
learning outcomes	 conveyir 	ng the factual conte	ent of te	xts. fo	rmulating	their co	nceptual	
6	information,	describe inferential	knowle	edge (p	oragmatic	focus) c	of both the entire	
	text and its in	dividual structural	elemen	ts;		,		
	• interpret	ing the informatior	n of the	text, to	o explain	in the sc	ope of the	
	certification r	equirements the st	ylistic a	nd ger	re specif	icity of the	he texts of the	
	socio-cultural	, socio-political, or	fficial b	usines	s and pro	fessional	spheres of	
	communication	on.						
	Students will	nave the skill to	inform	tion		noo w.:41	the situation of	
	 request 	and communicate	informa	uion ir d deed	1 accorda	cinants	use information	
	as a tool to in	fluence the interlo	cutor in	situati	ons of kn	owledge	and	
	communication in accordance with certification requirements;							

	• discuss ethical, cultural, socially significant issues in discussions, express their point of view, defend it with arguments, critically evaluate the opinion of interlocutors
	In terms of Competences, students will be able to
	 compose everyday, socio-cultural, official and business texts in accordance
	with generally accepted norms, functional orientation, using lexical-grammatical and pragmatic material of a certain certification level adequate to the goal.
Content	The course of the Russian language as a discipline of the general education cycle is designed for students of groups with the Kazakh language of instruction at universities, is studied in accordance with the requirements of the State Standard. The course is aimed at developing the language personality of the student, who is able to carry out cognitive and communicative activities in Russian in the areas of interpersonal, social, professional, intercultural communication in the context of the implementation of state trilingual programs and the spiritual modernization of national consciousness.
Media employed	Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	Basic Literature:
	1.Русский язык для IT специалистов. Составители: Молдахметова 3.Н,
	Маликова Ж.Д., Оразгалиева Л.М., Жусупов А.Е. – Астана, 2022 133 с.
	2. Ахметжанова А.И. Русскии язык: культура речи. – Алматы, «Қазақ vниверситеті». 2018 120 с.
	3. Русский язык для академических целей: учебное пособие для студентов
	факультетов естественных наук (коллектив составителей). – Алматы, 2018. –
	134 c.
	Supplementary literature:
	http://www.gramota.ru/
	http://insight.glos.ac.uk/researchmainpage/ResearchCentres/WAM/PGWAM/Do
	<u>cuments/portsmouth_narvard_guide.pdf</u>) https://scholar.google.com/scholar?g=+Galimzhan+seilov&htnG=&hl=ru&as_sd
	$\frac{100}{100} = 1000$
	http://festival.1september.ru
	http://www.antonchehov.ru/
	http://www.ajtmatov.ru/
	http://www.lihachev.ru/
	https://uwaterloo.ca/centre-for-teaching-excellence/teaching-resources/teaching-
	tips/developing-assignments/cross-discipline-skills/promoting-assessing-critical-

Module name:	Calculus 2
Code	
Trimester	4
Person	Assoc. Prof. Madi Raikhan, PhD
responsible	
for the module	
Lecturer(s)	Madi Raikhan, PhD,
	Kassabek Samat, PhD,
	Chiganbayeva Diana, PhD
	Satbayev Syndar, Msc
Language	English

Relation to curriculum	Bachelor programmes: Big Data Analysis, Software Engineering, IT. Compulsory course.							
Type of teaching	Lectures serve to introduce new concepts and provide theoretical and methodological foundations. Practice sessions (seminars) are active sessions to develop student's confidence through new examples and discussions on the problems. Instructor-supervised independent study (ISIS) deals with review and exploration in greater depth of the course material. Student's independent study (SIS): Self-study time including the time required to							
Workload of								
course components and credits per	ECTS credits	Cont Lecture s	tact hou Practi sessio	rs ce ns	ISIS	SIS	Total hou	rs
trimester	5	30	2	0	10	90	150	
Course								
assessment and	Period	Assessme	ent	Numb	ber	Exam	Form	Schedule
forms of		type		of poi	ints	<u> </u>		(Week #)
examination	1 st	1 st Homework		20		Submission of		Weekly
		Quiz		20		Writte	n	3 rd week
		Mid-term Exam		60		Writte	n	5 th week
		1 st attestation		100				
		total						
	2nd attestation	Homework		20		Submi writter	ssion of 1 reports	Weekly
		Quiz		20		Writte	n	8 th week
		End-term Exam		60		Writte	n	10 th week
		2 nd attestation		100				
	E's al Essay	total		100		W 7		Dearing fine1
	Final Exam			100		writte	n	exam session
	Cumulative	total for the	e course	e = 0,3	* 1 st A	tt + 0,3	* 2 nd Att +	• 0,4*Final = 100.
Requirements according to the examination	Course and Attendance	universit is manda	y polic tory. N	ies inc Iissing	lude: ; 30%	of less	sons will r	result in F (Fail)
regulations	grade (or su	ummer scl	hool).	. 1				
	Late submis	sions are n	tot acce	epted.		f data		and anth
	No cheating	g, dupiicat the Lectu	tion, ia	ISIIICAI	lion o	i data,	plagiarisi	m, and crib
	meetings wi	th the teac	her dur	ing off	ice ho	ours to	discuss the	e class.
Recommended	Linear Algeb	ra, Calculus	s I.	ing on	100 110			
prerequisites								
Module	By the end of	f this course	e studen	ts will a	attain 1	the follo	wing learn	ing outcomes.
ded learning	I ne student s	nould Iinisl	n this cl	ass with	1: contin	uity of f	unctions of	f several variables
outcomes	• all ul		g or min	ns allu				

	• the ability to compute partial derivatives and directional derivatives.
	• an understanding of linear approximation for multi-variable functions.
	• an introduction to optimization of multi-variable functions using the second
	derivative test and Lagrange Multipliers.
	• an understanding of infinite number series, functional series, (i.e., Power
	series, Taylor series, Fourier series) and applications.
	• the ability to evaluate iterated integrals.
	• the ability to use multiple integrals to calculate areas, volumes, masses and
	centers of mass for standard plane regions and solids.
	• an introduction to line integrals, path-independence, potential functions, and
	surface integrals.
	Students will have the skill to
	• Demonstrate knowledge of mathematical knowledge.
	• Understand basic mathematical principles (proving, solving).
	• Understand surface sketching nartial derivatives directional derivatives
	geometry of curves, geometry of surfaces, maxima and minima, infinite series,
	ODE, multiple integrals, line and surface integral.
	 Develop mathematical abilities in writing programs by computers.
	In terms of competences, students will be able to
	• write mathematical statements and problem solutions using mathematical
	symbols.
	• understanding of key mathematical concepts and the application of the main
	mathematical tools.
Content	The distinct feature of this part of the course is its focus on multi-dimensional
	analysis, as opposed to the one-dimensional analysis that you learned in Calculus I.
	This course covers the function of several variables, partial derivative, surface
	sketching, partial derivatives, directional derivatives, geometry of curves, geometry
	of surfaces, maxima and minima, infinite series, ODE, multiple integrals, line and
	surface integral. The ideas of calculus I-II apply to numerous areas of human
	knowledge such as engineering, physics, mathematics, biology, and many others.
Media	Multimedia classrooms equipped with computer, projection and audio system;
employed	Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	Basic Literature:
	1. W George b. Thomas, Jr., Ross L. Finney, Calculus and Analytic Geometry.
	Part II. Addison-Wesley Publishing Company. 14 th edition.
	2. Lecture presentations.
	Supplementary literature:
	1. Sherman K. Stein, Anthony Barcellos. Calculus and analytic geometry, 5th
	ed McGraw-Hill, Inc.1992.
	2. S. L. Ross, Differential Equations – John Wiley & Sons, 1984, 3rd ed.
	3. G. N. Berman, A collection of problems on a course of Mathematical
	Analysis

Module name:	Computer Organization and Architecture 1
Code	
Trimester	2,1
Person responsible for the module	Sandibek Umirov, Master of technical science in Computer system and Software, senior-lecturer, s.umirov@astanait.edu.kz, Astana IT University, Expo, C1.3.352.
Lecturer(s)	Dana Yespenbetova

т	Г 1.1							
Language	English							
Relation to	Bachelor programmes:							
curriculum	6B06101 "Computer Science"							
	6B06102 "Software Engineering"							
	6B06104 "Industrial Automation"							
	6D06105 "Madia Tashnalagias"							
	(D0(201 WT))		ologies	,,				
	6B06201 Te	lecommun	ications	1				
	6B06301 "Cyber Security «Compulsory course.							
Type of	Lectures On	line Video I	lecture					
teaching	Practice sess	ions (semi	nars) La	ab work	s with	hardwa	are devices	and software.
	Instructor-si	upervised i	indenen	dent st	udv (I	SIS) de	eals with re	view and
	exploration in	n oreater de	onth of t	he cour	se mat	erial		
	Student's in	donondont	otudu (olf stu	du timo	including	the time required to
	Student 8 m			515): 5	en-stu	dy time	menualing	the time required to
XX 11 1 C	prepare for a	nd complete	e all cou	irse asse	essmer	1ts .		
Workload of		1			1		1	
course	ECTS	Contact h	ours		ISIS	SIS	Total hou	irs
components and	credits	Lecture	Practi	ce				
credits per		s	sessio	ns				
trimester	5	20	30		10	90	150	
		20	50		10	70	120	
Course		1						
assessment and	Period	Assessme	ent	Numł	ber	Exam	Form	Schedule
forms of		type		of poi	nts			(Week #)
examination	1 st	Assignments		40		Lab works		Weekly
	attestation	Quiz Mid term Exem		40		Written		Weekly
								Weekiy
				20		Writto	n	5 th week
		Ivita-term	Exam	20		winte	11	JWEEK
		1 ^a attesta	ation	100				
		total						
	2nd	Assignme	ents	40		Lab w	orks	Weekly
	attestation	Quiz		40		Written,		Weekly
						Ouizze	es	
		End-term	Fram	20		Written		10 th week
			LAum	20		*******	11	10 WOOK
		and attact		100				
		2 ^{ad} attest	ation	100				
		total						
	Final Exam			100		Final e	exam	During final
						consis	ts of the	exam session
						100 qu	estions.	
						Theore	etical	
						questi	ns = 50	
						Practic	al co	
						Operti	an = 50	
						Questi	0118 - 30	
	Cumulative	total for the	e course	e = 0,3	* 1 st A	tt + 0,3	* 2 nd Att +	-0,4*Final = 100.
Requirements	Course and	universit	y polic	ies inc	lude:			
according to the	Attondance	je manda	tory N		300/	oflog	one will .	ocult in F (Fail)
examination	and - (is manua	1.01 y. 1) h.a.=1)	11991115	, 50 /0	01 1032	50113 WIII I	court in r (rail)
regulations	grade (or st	immer sc	1001).	, .				
regulations	Late submis	sions are r	not acce	epted.				
	No cheating, duplication, falsification of data, plagiarism, and crib							

r	
	Contacting the Lecturer : students are welcome to arrange one-to-one
	meetings with the teacher during office hours to discuss the class.
Recommended	Students should have the following skills and knowledge:
prerequisites	• PC and Internet navigation skills
	Basic Windows and Linux system concepts
	Basic Networking concepts
	Binary and Hevadecimal understanding
	• Awareness of hasis programming concents
Madula	
objectives/inten	By the end of this course students will attain the following learning outcomes.
ded learning	Course goal is to introduce the students to computer hardware and software, as well
outcomes	as operating systems, mobile devices, networking concepts, II security and
	troubleshooting. These course materials will assist you in developing the skills
	necessary to work as a technician in the field of IT.
	The primary objective of this course is to prepare students for entry-level positions
	in the IT field within several different working environments.
	Job titles include enterprise technician, IT administrator, field service technician,
	and PC technician.
	A remote-based work environment where client training, operating systems, and
	connectivity issues are emphasized. Job titles include remote support technician,
	help desk technician, call center technician, IT specialist.
	In addition, students will gain confidence with the components of desktop and
	lapton computers by learning the proper procedures for hardware and software
	installations, upgrades, and troubleshooting.
	Students will have the skill to
	Describe the components of a computer
	• Assemble a computer system install an operating system and traubleshoot
	• Assemble a computer system, instant an operating system, and troubleshoot
	Using system tools and diagnostic software
	• Students develop problem solving, critical thinking, collaboration,
	the manufaction, negotiation, and entrepreneurial skins, which can help
	them succeed today's global workplace.
	• Network
	Configure Firewall Settings
	Virtualization and Cloud Computing
	Use Mobile, Linux, and macOS Operating Systems
	Write IT Documentation
	Remote Technician
	In terms of Competences, students will be able to
	• Explain install and navigate an operating system: ungrade components
	based on customer needs and perform preventive maintenance and
	advanced troubleshooting
	Describe responses to the second seco
	• Describe, remove, and replace select components of a raptop; upgrade
	components based on customer needs and perform preventive maintenance
	and advanced troubleshooting.
	• Describe, remove, and replace select components of a printer/scanner;
	perform preventive maintenance and troubleshooting.
	• Describe and install a network; upgrade components based on customer
	needs and perform preventive maintenance and advanced troubleshooting.
	Apply good communication skills and professional behavior while working
	with customers.

	 Perform advanced installation of a desktop computer tower; select components based on customer needs and perform preventive maintenance and advanced troubleshooting. Upgrade security components based on customer needs and perform preventive maintenance and advanced troubleshooting. 							
Content	The course designed for people who are new to the study of information							
	technology, and does not require any prior skills.							
Media	Multimedia classrooms equipped with computer, projection and audio system;							
employed	Whiteboard; Microsoft Teams; LMS Moodle. Hardware(Printers, PC, Screws,							
	Tools, Crimping tools, Server, Ip camera, Cables, VirtualBox)							
Reading list	• Complete A+ Guide to IT Hardware and Software. Cheryl A. Schmidt							
-	• Computer Organization and Architecture. Eighth edition, William Stallings.							
	• Structures Computer Organization. Sixth edition. Andrew S. Tanenbaum,							
	Todd Austin.							
	Official Cert Guide CCNA 200-301. Volume 1. Wendell Odom.							
	Official Cert Guide CCNA 200-301. Volume 2. Wendell Odom.							
	Windows 10. Second Edition. Joan Lambert.							

Module name:	Database Management Systems							
Code								
Trimester	4							
Person responsible for the module	Senior Lecturer N. Assanova, M.Sc							
Lecturer(s)	Dariya Bissengaliyeva, M.Sc.							
Language	English							
Relation to curriculum	Bachelor prog IT Manageme	grammes: B ent,	Sig Data	Analys	sis, So	ftware E	Engineering	, Computer Science,
Type of teaching	 Lectures serve to introduce new concepts and provide theoretical and methodological foundations. Practice sessions (seminars) are active sessions to develop student's confidence through new examples and discussions on the problems. Instructor-supervised independent study (ISIS) deals with review and exploration in greater depth of the course material. Student's independent study (SIS): Self-study time including the time required to prepare for and complete all course assessments. 							
Workload of		1			1		1	
course	ECTS	Cont	act hour	'S	ISIS	SIS	Total hou	rs
components and	credits	Lecture	Practio	ce				
trimostor	5	S 20	sessio	ns	10	00	150	
	5	20	3	0	10	90	150	
Course				NT 1		1	-	
assessment and	Period	Assessme	nt	Numb	ber	Exam Form		Schedule
iorms of	1 st	type		01 p01	nts	0.1		(Week #)
CAMINIMATION	1 ^{cr}	Laborator	y	45		Submission of		2 and 4 weeks
	anostanon	Quiz		25		MCO	Test	3 rd week

		Mid-term Exam	30	Mixed tasks exam (theory and practice)	5 th week			
		1 st attestation total	100					
	2nd attestation	Problem Sets	30	Submission of tasks solved	7 th and 9 th weeks			
		Quiz	30	MCQ Test	8 th week			
		End-term Exam	40	Mixed tasks exam (theory and practice)	10 th week			
		2 nd attestation total	100					
	Final Exam		100	Mixed tasks exam (theory and practice)	During final exam session			
	Cumulative	total for the course	$e = 0,3 * 1^{st}$	$Att + 0,3 * 2^{nd} Att -$	+ 0,4*Final = 100.			
Requirements according to the examination regulations	Course and university policies include:Attendance is mandatory. Missing 30% of lessons will result in F (Fail)grade (or summer school).Late submissions are not accepted.No cheating, duplication, falsification of data, plagiarism, and cribContacting the Lecturer: students are welcome to arrange one-to-onemeetings with the teacher during office hours to discuss the class.							
Recommended prerequisites	ICT or basic computer knowledge							
Module objectives/inten ded learning outcomes	By the end of The student • choose correspondin • analy terms of the se • under • provi • use P • create • perfor functions. • enhan • look Students will • Desig • Use t problems. • Use F	E this course studen will show a worki se and apply app g tasks on the way ze the runtime per size of their request rstand the fundame de a consistent layor ostgreSQL built-in e transactions to so rm calculations ac nce query performa at a query plan to f I have the skill to: gn a database. gn transactional blo he PostgreSQL sup ribe the features an PostgreSQL progra	ts will attain ng knowled propriate m of impleme formance of s, averages, ntals of rela er of data ar functions f lve business cross a set ince by usin ind possible pecks to grou pplied built- d syntax of	the following learn lge to: ethodologies and nting the kind of ser of various approach best, and worst cas tional databases. ad control redundance for complex tasks. s challenges. of rows using with g indexes. e solutions to the pro- p related queries. in functions to solve PostgreSQL. structs and condition	hing outcomes. techniques to solve rvice's pipelines. es and commands in es. cies. ndow and aggregate oblems occurred. e sophisticated hally control code			

	Handle runtime errors.
	 In terms of Competences, students will be able to: design methodology for databases and verify their structural correctness. implement databases and applications software primarily in the relational model. use querying languages, primarily PostgreSQL, and other database supporting software; apply the theory behind various database models and query languages. implement security and integrity policies relating to databases.
Content	"Database Management Systems" is a course, which focuses on concepts and structures necessary to design and implement a database management system. Various modern data models, data security and integrity, and concurrency will be discussed.
Media employed	Multimedia classrooms equipped with computer, projection, and audio system; Whiteboard; Microsoft Teams; LMS Moodle; Software Applications for managing Databases (PostgreSQL server, pgAdmin, Command Line Tools, DataGrip, online diagramming applications).
Reading list	Basic Literature:1.Postgres: The first experience, P.Luzanov, E.Rogov, I.Levshin, 2020.2.Fundamentals of Database Systems, 7th Edition, R.Elmasri, S.Navathe, 20163.Jan L.Harrington. Relational Database Design and Implementation / L.H.Jan 4 ed Amsterdam : Elseiver Inc., 2016 689p ISBN 978-0-12-804399-8 :35900.00.004.65 - J 23.

Module name:	Analytic methods in Computer Science							
Code	(A roundation for computer science)							
Trimester	4 for the educational program Software Engineering, Big Data Analysis, Computer Science							
Person responsible for the module	Assoc. Prof. Nurlan Ismailov, PhD							
Lecturer(s)	Nurlan Ismailov							
Language	English							
Relation to curriculum	Bachelor programmes: Big Data Analysis, Software Engineering, IT Management. Elective course.							
Type of teaching	 Lectures serve to introduce new concrete examples and solution of them, Furthermore, it develops and provides solving methods based on these examples theoretical and methodological foundations. Practice sessions (seminars) are active sessions to develop student's confidence through new examples and discussions on the problems. Instructor-supervised independent study (ISIS) deals with review and exploration in greater depth of the course material. Student's independent study (SIS): Self-study time including the time required to prepare for and complete all course assessments. 							
Workload of	Contact hours ISIS SIS Total hours							

course	ECTS	Lecture	Practi	ce				
components and	credits	S	sessio	ns				
credits per	5	30	20		10	90	150	
trimester			•				•	
Course								1
assessment and	Period	Assessm	Number		Exam Form		Schedule	
forms of		type		of points				(Week #)
examination	lst	Problem Sets		20		Submi	ssion of	2nd week and
	attestation			20		Written	1 reports	4th weeks
		Quiz Mid torr		20		Writte	n 	Std week
		Exam	From			writte	Π	Jun week
		1st atte	station	100				
		total	station	100				
	2nd	Problem	Sets	20		Submi	ssion of	7th week and 9th
	attestation					written	n reports	
		Quiz		20		Writte	n	8th week
		End-tern	1	60		Writte	n	10th week
		Exam	1			*******		
		2nd atte	station	100				
		total						
	Final Exam			100		Written		During final
								exam session
		. 1.0 1		0.0				
	Cumulative t	otal for the	e course	= 0,3	* Ist A	Att + 0, 3	3 * 2nd Att -	+0,4*Final = 100.
Requirements	In case if the	student d	id not	attend	more	than 3	0% of the	classes without any
according to the	reasonable ex	cuses. the	teacher	has a	right	to mark	thim as "n	ot graded", and the
examination	student would	n't be adm	itted to	the exa	am. In	other v	vords, stude	ents must participate
regulations	in at least 70% of all online/offline class time, otherwise he/she fails the course.							
Recommended	"Discrete Mat	hematics"	or "Alg	orithms	s and I	Data stru	uctures",	
prerequisites	or "Algorithms".							
Module objectives/inten								
ded learning	The course pro	esents matl	hematic	al mate	rials n	ecessar	v for the Co	mputer Science
outcomes	student to app	roach the s	tudy of	many a	idvanc	ed topi	cs in theore	tical Computer
	Science at the	graduate l	evel.	5		1		1
		-						
	By the end of	this course	studen	ts will a	ttain 1	the follo	wing learni	ng outcomes.
	The student v	vill show a	a worki	ng kno	wledg	e in:		
	 To demonstrate knowledge of mathematical knowledge; To understand basic mathematical principles (proving, counting, understanding discrete objects); To solve counting problems using different enumeration methods: 							
	- To develop r	nathematic	al abili	ties in v	vriting	g progra	ms by com	outers.
	1				2	01 0	5 1	
	Students will	have the s	skill to					
	- To understar	d basic ma	athemat	ical prin	nciple	s (provi	ng, counting	g, understanding
	discrete object	ts).						
	-To learn main	n analytic n	nethods	throug	h con	crete ex	amples fron	n enumerative
		, number t	neory and	id discr	ete ma	athemat	ics, probabi	llity.
	- To analyze different mathematical methods.							

	- To solve concrete problems using different enumeration methods.
	- To develop mathematical abilities in writing programs by computers.
	Skills & Competences:
	- Basic school mathematical knowledge
	- Ability to construct examples and counterexamples
	- Working with discrete objects
	In terms of Competences, participants will be able to:
	-become familiar with different mathematical methods in combinatorics, number
	theory, discrete mathematics, and statistics.
	-apply skills acquired in discrete mathematics, linear algebra
	and/or computation to the analysis and calculation of graph properties;
	- describe programing questions in terms of graphs and trees.
	-understand concrete problems as a unifying abstraction of natural and
	computing systems:
	-are enabled and motivated to begin independent project / research
	work in discrete mathematics and computation Understand counting principles of
	combinatorics:
	- Be able to transform discrete problems into simple forms;
	- Describe programing questions in terms of graphs and trees.
Content	The course includes recursions, sums, integer functions, elementary number theory,
	binomial coefficients, special numbers, generating functions, discrete probability,
	asymptotics.
Media	Multimedia classrooms equipped with computer, projection and audio system:
employed	Goodnotes: Microsoft Teams: LMS Moodle.
emproyee	
Reading list	1. Lecture slides/presentations/notes.
8	Main textbooks:
	2. R. Graham, D. Knuth, O. Patashnik, Concrete Mathematics: A Foundation for
	Computer Science (2nd Edition).
	Additional textbooks:
	3. D. E. Knuth. The Art of Computer Programming, Volume 1, 3rd, Edition, Addison-
	Wesley, 1998.
	4. N.J.A. Sloan's On-Line Encyclopedia of Integer Sequences.
	Open Online Resources
	1. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-042i-
	mathematics-for-computer-science-fall-2010/
	2. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-042i-
	mathematics-for-computer-science-spring-2015/index.htm

5th term

Module name:	Kazakh language, Advanced (C1)					
Code	K(R)Ya 1104 K(R) Ya 2105					
Trimester	5					
Person	Assoc. Prof. G.Kamiyeva, PhD					
responsible	Assoc. Prof. B. Dinayeva, PhD					
for the module	Assoc. Prof. S. Sapina, PhD					
Lecturer(s)	G.Kamiyeva,					
	B.Dinayeva,					
	S.Sapina					
Language	Kazakh language					
Relation to	Bachelor programmes: Computer Science, Software Engineering, Big Data					
curriculum	Analysis, Industrial Automation, Media Technologies, Cyber Security,					
	Telecommunication Systems, IT Management, Digital Journalism.					

	Compulsory	course.						
Type of teaching	Practice sessions (seminars) are active sessions to develop student's confidence							
	through new examples and discussions on the problems.							
	Instructor-supervised independent study (ISIS) deals with review and							
	exploration in	exploration in greater depth of the course material.						
	Student's ind	dependent study (SIS): Se	elf-stu	dy time	including	the time required	
XX 11 1 0	to prepare for	r and complete all c	course a	ssessr	nents.			
Workload of								
course	ECTS	Contort how			CIC	Tatalhar		
credits per	credits	Practice sessions	15	1515	515		u18	
trimester	5			50	50	150		
		50		50	50	150		
Course								
assessment and	Period	Assessment	Numb	ber	Exam	Form	Schedule	
forms of		type	of poi	nts			(Week #)	
examination	1 st	Problem Sets	30		Submi	ssion of	Weekly	
	attestation				writter	n reports		
		Quiz	30		Writte	n	3 rd week	
		Mid-term Exam	40		Writte	n	4 th week	
		1 st attestation	100					
		total						
	2nd	Problem Sets	30		Submi	ssion of	Weekly	
	attestation				writter	n reports		
		Quiz	30		Writte	n	7 th week	
		End-term Exam	40		Writte	n	9 th week	
		and attacted are	100					
		2 ^{ad} attestation	100					
	Final Exam	totai	100		Writte	n	During final	
			100				exam session	
			I		I			
	Cumulative total for the course = $0.3 \times 1^{\text{st}}$ Att + $0.3 \times 2^{\text{nd}}$ Att + $0.4 \times \text{Final} = 10^{10}$						+ 0,4*Final = 100.	
Requirements	Course and	university polic	ies inc	lude:				
according to the	Attendance	is mandatory. N	lissing	30%	of less	ons will re	esult in F (Fail)	
examination	grade (or su	ummer school).						
regulations	Late submis	sions are not acce	epted.					
	No cheating	g, duplication, fa	lsificat	tion o	f data,	plagiaris	m, and crib	
	Contacting	the Lecturer: stu	idents a	are w	elcome	to arrang	e one-to-one	
	meetings wi	th the teacher dur	ring off	ice ho	ours to	discuss th	e class.	
	_		_					
Recommended	B1 level of th	e Kazakh language	e					
prerequisites								
		0.1 1	, ••••	<i></i> •	1 0 11	• •	•	
Module	By the end of	t this course studen	ts will a	attain	the follo	wing learn	ning outcomes.	
objectives/inten	The		n a 1-	1- 1				
ded learning	I ne student	will snow a worki	ng Kno	wiedg	ial busic	need and to	urnalistia stylas	
outcomes	• rearining the	his thoughts accur	ately ar	, orne nd eki	1a1-04811 11fm11v - 1	ising all th	e richness of the	
	language	ins moughts accur	aiciy al	IG ONI	inuny, t	ang an th		
	• using langu	age patterns in soc	ial. cult	tural a	nd educ	ational cor	nversations	
		U 1	,					

	 Students will have the skill to interpret the text and follow it by determining the purpose of the text, the main game, the problem considered in the text, additional information, evaluating it; give critical opinion, support, suggestions, solutions to problems on the read text/article; use the information in the text while writing essays, making project works and presentations, speaking his opinion during interviews and round tables. In terms of Competences, students will be able to participate in various situations in the field of communication in the lexical-grammatical and pragmatic sense express personal opinions in planning, solving problems, making decisions due to different social, cultural and academic contexts critically evaluate, analyze and summarize information
Content	The subject "Kazakh language" is intended for students at the C1 level. Practical Kazakh language is intended for teaching the Kazakh language to students of Russian departments. The curriculum of the Kazakh language is based on the latest linguistic and methodological achievements of the teaching of the Kazakh language in the lecture halls of other languages. The educational-methodological complex is based on a modular training system. The proposed program takes into account the educational levels of students, the purpose, value and positions of the lesson, skills and dexterity, types of speaking activities; It consists of content that meets the requirements of listening, speaking, writing (reading, writing, listening, pronunciation, etc.)
Media employed	Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	 Basic Literature: 1. Karabaeva K.A. Kazakh language: educational tool Almaty: Kazakh University, 2014. 2. Linear C. Kazakh language guide (spelling, punctuation marks, vocabulary). Astana: Elorda, 2000 532 p. 3. "Digital educational resources" related to the subject "Kazakh language-I" and "Kazakh language-II" for students studying in the Russian department Astana, 2014. 4. Dinaeva B.B., Kamieva G.K. Kazakh language. Educational tool for IT students Astana, 2023 200 p. 5. Dinaeva B.B. The language of business correspondence: a study guide for students of all professions Nur-Sultan, 2022296 p. 6. Kamieva G.K. Keeping documents in the state language. Educational tool Nur-Sultan, 2021147 p.
	 Supplementary literature: 1. Akanova D.H., Aldasheva A.M., Akhmetzhanova Z.K., Kadasheva K., Suleymenova E.D. Official business Kazakh language. Textbook complex. First level. Second level. Third levelAlmaty, "Arman-PV", 2002. 2. Bizakov S. Dictionary of synonyms - Almaty: "Arys" publishing house, 2007 640 p. 3. Chesenbaev I. Phraseological dictionary - Almaty: "Arys" publishing house, 2007 640 p. 3. Chesenbaev I. Phraseological dictionary - Almaty: "Arys" publishing house, 2007 800 p. 4. Kazakh language and national values. A comprehensive study tool. Book 1,2,3,4 Almaty: Evero, 2018. 5. Explanatory dictionary of the Kazakh language: about 50 thousand words and phrases / general editor. T. Zhanuzakov Almaty: Dyke-Press, 2008 968 p.

6. Spelling dictionary / Sixth edition. Compiled by: N. Vali, K. Kuderinova, A.
Fazylzhanova, Zh. Isaeva, N. Amirzhanova, A. Amirbekova Almaty: Davir
publishing house, 2013 720 p.

Module name:	Kazakh Language (for foreigners). Elementary (A2)							
Code	K(R)Ya 1104 K(R) Ya 2105							
Trimester	5							
Person	Assoc. Prof.	B. Dinayeva, PhD						
responsible		, ,						
for the module								
Lecturer(s)	B. Dinayeva,							
Language	Kazakh lang	Kazakh language						
Relation to	Bachelor pro	grammes: Software	e Engine	eering,	IT Ma	nagement.		
curriculum	Compulsory	course.	C C			C		
Type of teaching	Practice sess	sions bring students	s' readir	ıg, list	ening, v	writing and	l speaking skills to a	
Тип	level where t	hey can understand	•	-	-	-		
преподавания	Student's in	dependent study (SIS): S	elf-stu	ıdy time	e including	the time required to	
	prepare for a	nd complete all cou	irse asse	essmer	nts.			
Workload of								
course	ECTS	Contact hou	rs	ISIS	SIS	Total hou	ırs	
components and	credits	Practice sessions						
credits per	5	50		10	90	150		
trimester								
Course								
assessment and	Period	Assessment	Numb	ber	Exam	Form	Schedule	
forms of		type	of poi	nts			(Week #)	
examination	1 st	Problem Sets	30		Submi	ssion of	Weekly	
Оценка курса и	attestation				writter	n reports		
формы		Quiz	30		Writte	n	3 rd week	
экзамена		Mid-term Exam	40		Writte	n	4 th week	
		1 st attestation	100					
		total						
	2nd	Problem Sets	30		Submi	ssion of	Weekly	
	attestation				writter	n reports		
		Quiz	30		Writte	n	7 th week	
		End-term Exam	40		Writte	n	9 th week	
							y week	
		2 nd attestation	100					
		total	200					
	Final Exam		100		Writte	n	During final	
							exam session	
			1					
	Cumulative total for the course = $0.3 * 1^{\text{st}} \text{Att} + 0.3 * 2^{\text{nd}} \text{Att} + 0.4 * \text{Final} = 100.$						+ 0,4*Final = 100.	
							<i>.</i>	
Requirements	Course and	university polic	ies inc	lude:				
according to the	Attendance	e is mandatory. N	Aissing	30%	of less	sons will	result in F (Fail)	
examination	grade (or si	ummer school).	8	,				
regulations	Late submis	sions are not acce	epted					
	No cheating	dunlication fa	rrieu. Isificot	ion of	f data	nlagiarie	m and crib	
	1 TO CHEATIN	5, uuphtation, la	isincal	1011 U	i uata,	Pragrar 19	m, and CI ID	

	Contacting the Lecturer: students are welcome to arrange one-to-one
	meetings with the teacher during office hours to discuss the class.
Recommended	A1 level of the Kazakh language
prerequisites	
Module	
objectives/inten	By the end of this course students will attain the following learning outcomes.
outcomes	• developing communication skills through speaking reading listening and
	writing tasks;
	• learning simple words and phrases,
	• learning to use words and phrases appropriately and to create a dialogue
	according to the situations encountered in everyday life. Students will have the skill to
	• from the information heard, they determine the specific vocabulary related to
	the topic and use it in everyday life;
	• use words, phrases and grammatical structures appropriately;
	• read the text fluently.
	• Write information about about him/herself, family, address, place of birth, etc.
	In terms of Competences, students will be able to
	• study, work, free time, etc. understands the content of simple text in topics;
	• ask and answer questions in various situations;
	• write simple dictation according to KAZTEST requirements.
Content	The subject "Kazakh language" is intended for students at the A2 level. Students from
	abroad study the A2 level as a continuation of the initial level, at the end of the course
	students should learn 1400-1500 words. A2 level focuses on the formation of the ability to exchange simple information within the presented levical tonics to
	understand common words and individual sentences, to describe events and activities
	in everyday life, to talk about oneself, relatives and acquaintances.
	The "Kazakh language" A2 level course teaches the student to use the Kazakh
Math	language at a basic level through reading, writing, listening, and pronunciation skills.
employed	Wultimedia classrooms equipped with computer, projection and audio system; Whiteboard: Microsoft Teams: LMS Moodle
employed	whiteboard, wherosoft reams, Ewis woodie.
Reading list	Basic Literature:
Список для	1. L. Beysenbaeva, A. Balabekov, A. Zhakypzhanova "Kazakh language" textbook
чтения	10r relatives abroad (A1 - basic level) Nur-Sultan, 2021. 2 N Dauletkereeva N Nurmagambetova A Smykova "Kazakh language" textbook
	for relatives abroad (A2 - basic level) Nur-Sultan, 2021.
	3. G.K. Dosmambetova, A.K. Balabekov, A.T. Bozbaeva-Hung, A.D. Seisenova.
	Kazakh language. Simple level A1. Textbook Astana: National Testing Center,
	2016268 p.
	Supplementary incrature: 1 Tileshov E. Turlybekova I. Kavunova N. Let's learn Kazakh - Astana.
	"Rukhaniyat", 2010.
	2. Bekturova A.Sh., Bekturov Sh.K. Kazakh language for all Almaty: Atamura,
	2004720 p.

Module name:	Russian Language
Code	K(R)Ya 1104

Trimester	5									
Person	Assoc. Prof.	L.Orazgalieva, can	didate c	of phil	ological	sciences				
responsible		C ,		•	U					
for the module										
Lecturer(s)	Zhusupov A.	E. –a.zhussupov <u>@</u> a	astanait	.edu.k	z, Asso	c. Prof., car	ndidate of			
	philological s	ciences								
	Orazgalieva l	L.M. – <u>Laura.Oraz</u> g	galiyeva	a@ast	anait.ed	<u>u.kz,</u> Assoc	c. Prof., candidate of			
	philological s	ciences, Assoc. Pro	of., can	didate	of philo	ological sci	ences			
	Moldachmeto	ova Z.N. –z.moldak	hmetov	va <u>@as</u>	tanait.eo	<u>lu.kz,</u> Asso	c. Prof., candidate of			
	philological s	sciences								
	Shaheen A.A	Shaheen A.A. –a.shaheen@astanait.edu.kz, Assoc. Prof., candidate of philological								
	sciences									
	Malikova Zh.D. zhanar.malikava@astanait.edu.kz, Assoc. Prof., candidate of									
	philological s	philological sciences								
Language	Russian									
Relation to	6B06101 - C	Computer Science,	6B061	02 - 5	Software	e Engineer	ing, 6B06103 – Big			
curriculum	Data Analysi	s, 6B06104 – Indu	strial A	utoma	ation, 61	306105 – N	Media Technologies,			
	6B06301 – C	yber Security, 6B0	6201 -	Telec	commun	ication Sys	stems, 6B04101 – IT			
	Management	, 6B06202- Sma	rt Tech	nolog	gies, $6B$	03201 –	Dıgıtal Journalısm,			
	6B06106 - M	athematical and Co	omputat	ional	science.					
T. C. 1:	Compulsory	course.			• ,	1 1	<u>, 1 , 2 , 6 1</u>			
Type of teaching	Practice sess	sions (seminars) a	re actr	ve ses	sions to	develop s	student's confidence			
	through new	examples and disci	lssions	on the	e problei	ns.	• • • •			
	in greater der	upervised indepen	aent st	uay (I	1515) de	als with rev	new and exploration			
	In greater dep	denendent study (\mathbf{SIS}	alf at	dy time	including	the time required to			
	propaga for a	ad complete all cou	515): 5		udy tille nto	menualing	the time required to			
Workload of		id complete an cou	115C ass	2551110	1115.					
course	FCTS	Contact hour	re		212	Total hou	Irc			
components and	credits	Practice sessions	15	1515	515		113			
credits per	5	50		10	90	150				
trimester				10	20	100				
Course										
assessment and	Period	Assessment	Numb	ber	Exam	Form	Schedule			
forms of		type	of poi	nts			(Week #)			
examination	1 st	Problem Sets	30		Submi	ssion of	Weekly			
	attestation				writter	n reports				
		Quiz	30		Writte	n	2 rd week			
		Mid-term Exam	40		Writte	n	4 th week			
		1 st attestation	100							
		total								
	2nd	Problem Sets	30		Submi	ssion of	Weekly			
	attestation				writter	n reports				
		Quiz	30		Writte	n	8 th week			
		End-term Exam	40		Writte	n	10 th week			
		2 nd attestation	100							
		total								
	Final Exam		100		Writte	n	During final			
							exam session			
	Cumulative	total for the course	e = 0,3	* 1 st A	Att + 0,3	* 2 nd Att +	-0,4*Final = 100.			

Requirements according to the examination regulations	Course and university policies include: Attendance is mandatory. Missing 30% of lessons will result in F (Fail) grade (or summer school). Late submissions are not accepted. No cheating, duplication, falsification of data, plagiarism, and crib Contacting the Lecturer: students are welcome to arrange one-to-one meetings with the teacher during office hours to discuss the class.
Recommended prerequisites	Cultural studies
Module objectives/inten ded learning outcomes	 By the end of this course students will attain the following learning outcomes. The student will show a working knowledge in: increasing the level of academic literacy or grammatical competence in the language (spelling, punctuation); developing the skills of creating texts through critical (analytical) reading of fiction, educational and scientific literature; creating different types of essays according to the content and structure requirements. Students will have the skill to: identify specific vocabulary related to the topic and use it in everyday life and academic settiggs; knowing the qualities of professional speech: richness, purity, logic, expressiveness, accuracy, correctness, clarity and intelligibility. expressing your attitude in accordance with the requirements of the professional culture of speech: use terminology, discuss professional topics with a colleague and a layman, define the goal, be correct. giving an assessment of the fact, object, and event. In terms of competencies, students will be able to: compose scientific texts (annotations, reviews, etc.) use speech aspects of business communication; perform in front of an audience using the techniques of public speaking. The course of the Russian language as a discipline of the general education cycle is designed for students of groups with the Kazakh language of instruction at universities, is studied in accordance with the requirements of the State Standard. The course is aimed at developing the language personality of the student, who is able to carry out cognitive and communicative activities in Russian in the areas of interpersonal, social, professional, intercultural communication of nation of national consciousness.
Media employed	Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	Вазіс Literature: 1.Русский язык для IT специалистов. Составители: Молдахметова З.Н, Маликова Ж.Д., Оразгалиева Л.М., Жусупов А.Е. – Астана, 2022 133 с. 2. Ахметжанова А.И. Русский язык: культура речи. – Алматы, «Қазақ университеті», 2018 120 с. 3. Русский язык для академических целей: учебное пособие для студентов факультетов естественных наук (коллектив составителей). – Алматы, 2018. – 134 с. Supplementary literature: http://www.gramota.ru/

http://insight.glos.ac.uk/researchmainpage/ResearchCentres/WAM/PGWAM/Docu
ments/portsmouth_harvard_guide.pdf)
https://scholar.google.com/scholar?q=+Galimzhan+seilov&btnG=&hl=ru&as_sdt=
<u>0%2</u>
http://festival.1september.ru
http://www.antonchehov.ru/
http://www.ajtmatov.ru/
http://www.lihachev.ru/
https://uwaterloo.ca/centre-for-teaching-excellence/teaching-resources/teaching-
tips/developing-assignments/cross-discipline-skills/promoting-assessing-critical-
thinking

Module name:	Political Scie	ence								
Code										
Trimester	5									
Person	Maral Zhanar	Maral Zhanarstanova, PhD in Political Science, assistant professor								
responsible	Yenglik Doss	Yenglik Dossymkhan, PhD in Political Science, senior lecturer								
for the module	Aidana Kaldybekova, MA, lecturer									
Lecturer(s)	Maral Zhanar	Maral Zhanarstanova, PhD								
	Yenglik Doss	symkhan, P	hD							
	Aidana Kaldy	/bekova M/	A							
Language	English									
Relation to	Bachelor prog	grammes: a	ll major	ĩS						
curriculum	Compulsory of	Compulsory course.								
Type of teaching	Lectures serv	ve to introdu	ice new	concep	ts and	provide	theoretical	and methodological		
	foundations.									
	Practice sess	sions (semi	i nars) a	ire activ	ve ses	sions to	develop s	student's confidence		
	through new	examples ar	nd discu	issions	on the	politica	al problems			
	Instructor-su	ipervised i	ndepen	dent st	udy (I	ISIS) de	als with rev	view and exploration		
	in greater dep	th of the co	ourse ma	aterial.	10	a ,•				
	Student's inc	dependent	study (SIS): 5	elt-stu	idy time	e including	the time required to		
Wartstaad of	prepare for ar	ia complete	e all cou	irse asse	essmei	nts.				
workload of	ECTS	Cart	1		1010	CIC	Tatalhan			
course	ECIS	Leature	Due eti	rs	1919	515	1 otal nou	rs		
components and	credits	Lecture	Practic	ce						
trimester	5	10		$\frac{\text{ns}}{0}$	10	20	60			
timester		10	1	0	10	50	00			
Course										
assessment and	Period	Assessme	ent	Numł	ber	Exam	Form	Schedule		
forms of		type of points (Week #						(Week #)		
examination	1 st	Lecture Q	uiz	10		Quiz		Weekly		
	attestation									
		Discussio	ns	20		Orally		Week 2-3		
		Group pro	oject	30		Writte	n	Week 4-5		
		Mid-term	Exam	40		Quiz		Week 5		

		4.04	100				
		1 st attestation total	100				
	2nd attestation	Lecture Quiz	10	Quiz	Weekly		
		Discussions	20	Orally	Week 6-7		
		Group project	30	Written	Week 8-9		
		Mid-term Exam	40	Quiz	Week 10		
		2 nd attestation	100				
		total					
	Final Exam	1	100	Quiz	During final exam session		
	Cumulative	total for the course	$e = 0,3 * 1^{st}$	$Att + 0,3 * 2^{nd} Att -$	+ 0,4*Final = 100.		
Requirements according to the examination regulations	Course and university policies include:Attendance is mandatory. Missing 30% of lessons will result in F (Fail)grade (or summer school).Late submissions are not accepted.No cheating, duplication, falsification of data, plagiarism, and cribContacting the Lecturer: students are welcome to arrange one-to-onemeetings with the teacher during office hours to discuss the class.						
Recommended prerequisites	History of Ka	zakhstan, Cultural	studies, Soci	iology			
Module objectives/inten ded learning outcomes	By the end of this course students will attain the following learning outcomes. The student will show a working knowledge in: - get acquainted with basic elements of political theory and political concepts; - explore the various topics covered in Political Science, its history, its imp society and individuals, and its limitations in real world applications; - gain a working understanding of the field of Political Science and all it encomp - acquire the capacity to interpret and assess political ideas and political beha in an independent manner; - develop argumentative skills on conflicting topics; - formation of critical thinking and functional literacy skills. Students will have the skills: - ability to understand political theories and concepts in order to understand dif- viewpoints; - ability of think critically and enhance problem-solving skills; - ability of carrying out individual works on researching, drafting, writing and ex- ability to select and use reference materials; - ability of discussing and interpreting different political thoughts and trends. In terms of Competences, students will be able to - understand political behaviour in connection with social change and challeng - understand the role and function of the politics in everyday life; - have a basic comprehension on characteristics of political thoughts and theori - interpret and apply concents, ideas and notions on political morests						
Content	This course is an introduction to the basic theories and concepts in the Political Science, including: connection between everyday life with the political system; historical development of the area; political systems, ideologies & philosophies:						

	international relations; and Kazakhstan's profile in the framework of the studied discourses. Related topics include interdisciplinary areas, such as sociology, economy, culturology, public policy and security studies. This course will offer an overview of current research in the field of political science, with an emphasis on theoretical studies in this field and on studies that focus on political situation in the Republic of Kazakhstan.
Media	Multimedia classrooms equipped with computer, projection and audio system;
employed	Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	 Basic Literature: W. Philips Shively. Power and Choice: An Introduction to Political Science. Rowman & Littlefield Publishers. 2018. Michael Marder. Political Categories. Thinking beyond Concepts. New York. Columbia University Press. 2019. William N. Dunn. Public Policy Analysis An Integrated Approach Sixth Edition. Routledge and Taylor & Francis Group, 2018. David Williams. Progress, Pluralism, and Politics: Liberalism and Colonialism, Past and Present. Montreal: McGill-Queen's University Press. 2020. Supplementary literature: Simon, D. W., Romance, J., & Riemer, N. (2018). The challenge of politics: an introduction to political science. CQ press. Pinker, S. (2018). Enlightenment now: The case for reason, science, humanism, and progress. Chicago (Author-Date, 15th ed.). Gates, M. (2019). The Moment of Lift: How Empowering Women Changes the World (Unabridged). Hawking, S., Redmayne, E., Thorne, K. S., & Hawking, L. (2020). Brief answers to the big questions. John Murray. Gates, B. (2021). How to avoid a climate disaster: the solutions we have and the breakthroughs we need. Penguin UK.

Module name:	Computational Mathematics
Code	
Trimester	5 for Sofware Engineering, Big Data Analysis, Computer Science
Person responsible for the module	Senior Lecture Rakhimzhanova Anar, PhD
Lecturer(s)	Samat Kassenov
Language	English
Relation to curriculum	Bachelor programmes: Computational Mathematics. Compulsory course.
Type of teaching	Lectures serve to introduce new concepts and provide theoretical and methodological foundations.
	Practice sessions (seminars) are active sessions to develop student's confidence through new examples and discussions on the problems.

Workload of	Instructor-supervised independent study (ISIS) deals with review and exploration in greater depth of the course material. Student's independent study (SIS): Self-study time including the time required to prepare for and complete all course assessments.							
course	ECTS	Cont	act hou	rs	ISIS	SIS	Total hou	rs
components and	credits	Lecture	ce					
credits per		S	sessio	ns				
trimester	5	30	2	0	10	90	150	
Course								
assessment and	Period	Assessme	nt	Numb	ber	Exam	Form	Schedule
forms of		type		of poi	nts			(Week #)
examination	1 st	Problem S	Sets	20		Submi	ssion of	2 nd week and 4 th
	attestation					writter	n reports	weeks
		Quiz		20		Writte	n	3 rd week
		Mid-term	Exam	60		Test		5 th week
		1 st attesta total	tion	100				
	2nd	Problem S	Sets	20		Submission of		7 th week and 9 th
	attestation					writter	n reports	
		Quiz		20		Writte	n	8 th week
		End-term Exam		60		Test		10 th week
		2 nd attestation total		100				
	Final Exam			100	100 Written			During final exam session
Requirements according to the	Cumulative total for the course = $0.3 * 1^{st} Att + 0.3 * 2^{nd} Att + 0.4*Final = 100$. In case if the student did not attend more than 30% of the classes without any reasonable excuses the teacher has a right to mark him as "not graded" and the							
examination regulations	student would in at least 70%	dn't be adm % of all onli	itted to ine/offli	the exa	am. In s time,	other w otherw	vords, stude vise he/she	ents must participate fails the course.
Recommended prerequisites	"Calculus 1",	"Calculus	2", "Lir	near alg	ebra"			
Module objectives/inten ded learning outcomes	 Course goal(s): This course is an advanced introduction to numerical linear algebra and related numerical methods. Topics include direct and iterative methods for linear systems, eigenvalue decompositions and LU factorizations, stability and accuracy of numerical algorithms. Numerical differentiation and integration. Interpolation. Least squares and regression analysis. Numerical solution of ordinary differential equations. Introduction to error analysis. By the end of this course students will attain the following learning outcomes. The student will show a working knowledge in: To demonstrate knowledge of mathematical knowledge; To apply basic techniques involving computational mathematics; To develop mathematical abilities in writing programs by computers. 							
	Students will have the skill to							

	 To enhance the problem-solving skills of students using an extremely powerful problem-solving tool namely numerical method; To able to work with handling large system of equations, non-linearities and complicated geometries that are not uncommon in engineering practice and that are for impossible to substantiable. 									
	In terms of Competences students will be able to:									
	- Understand numerical techniques to find the roots of non-linear equations and solution of system of linear equations.									
	- Use Taylor Series to approximate functions and evaluate the approximations error.									
	- Program algorithms to locate the roots of nonlinear equations.									
	- Program algorithms to solve linear system of equations.									
	- Smooth engineering collected data using least square method.									
	- Understand the difference operators and the use of interpolation.									
	- Understand numerical differentiation and integration and numerical solutions of ordinary differential equations.									
Content	The course includes logics, set theory, functions, and fundamental principles of counting, number theory, inclusion-exclusion principle, recurrence relations, graph theory.									
Media employed	Goodnotes; Microsoft Teams; LMS Moodle.									
Reading list	1.Lecturenotes(availableatmoodle.astanait.edu.kz);2. B.S. Grewal, "Numerical Methods in Engineering & Science", Khanna Publication,Ed.9th.3. E. Kreyszing "Advanced Engineering Mathematics" john Wiley & sons, inc, Ed10 th .									

Module name:	Operating systems
Code	
Trimester	5
Person	Gulsim Tulepova, M.Sc.
responsible	
for the module	
Lecturer(s)	Gulsim Tulepova, M.Sc., Senior-lecturer Department of Intelligent
	Systems & Cyber Security, g.tulepova@astanait.edu.kz
	Astana IT University, Expo, C1 block, 3 rd floor, office C1.1.329
Language	English
Relation to curriculum	Bachelor programmes: Software Engineering, Compulsory course.
Type of teaching	Lectures serve to introduce new concepts and provide theoretical and methodological foundations.
_	Practice sessions (seminars) are active sessions to develop student's
	confidence through new examples and discussions on the problems.
	Instructor-supervised independent study (ISIS) deals with review and
	exploration in greater depth of the course material.
	Student's independent study (SIS): Self-study time including the time
	required to prepare for and complete all course assessments.
Workload of	

course	FCTS	Cont	act hou	rs	ISI	SIS	Total			
components	credits	Lecture	Practi		S	515	hours			
and credits per	creatts	C	raci	nc nc			nouis			
trimester	5	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$		0	10	90 150				
umester		20	5	0	10	90	130			
Course										
assessment and	Deriod Aggaggment Number From Form Color							Schedule		
forms of	1 chioù	tune	ciit	of points		L'Adiff	ronn	(Week #)		
examination	1 st	Problem Sets		30		Submission of		Weekly		
CAdminution	attestatio	1 Iobieni Sets		30		writte	n reports	weekiy		
	n	Ouiz		30	30		n reports	3 rd week		
		Mid-term	1	40		Writte	n n	5 th week		
		Exam				*******		5 WOOK		
		1 st attest	ation	100						
		total								
	2nd	Problem	Sets	30		Subm	ission of	Weekly		
	attestatio					writte	n reports			
	n	Quiz		30		Writte	en	8 th week		
		End-term		40		Written		10 th week		
		Exam								
		2 nd attest	tation	100						
		total								
	Final Exam	ı		100	100 Written			During final		
							exam session			
		Cumulative total for the course = $0.3 * 1^{st} Att + 0.3 * 2^{nd} Att + 0.4*Final$								
	= 100.									
Requirements	Course and	universit	v nolic	ies inc	lude:					
according to the	Course and university poncies include.									
avamination	Attendance is mandatory. Missing 30% of lessons will result in F (Fail)									
regulations	grade (or summer school).									
regulations										
	Late submis	Late submissions are not accepted.								
	No cheating, duplication, falsification of data, plagiarism, and crib									
	Contacting	tha Lactu	ror. etc	idente	are W	elcome	to arrange	one-to-one		
	meetings wi	th the teacl	her dur	ing off	ice ho	ours to	discuss the	e class		
	meetings wi		lier dur	ing on		<i>u</i> 13 to t		- Class.		
Recommended	Prerequisite	for this o	course	is an	inter	nediate	e level of	understanding of		
prerequisites	personal co	mputers a	nd op	erating	syst	ems e	quivalent	to the A + $/$ IT		
	Fundamenta	ls levels.								
	• Basic com	puter litera	cy		. 1	-:11.				
	• Basic PC c	perating s	ystem i	navigat	ion sł	CIIIS				
Modula	• Basic inter	net usage s	SKIIIS	a to:						
objectives/inte	evolu	ore function	ns of o	s iU. neratin	σ εντεί	ems				
50jeeuves/mie	• Stud	v of Rasic	comme	ands of	5 syst Linu	x				
	• Study of Basic commands of Linux.									

outcomes • Study of current directory according to the following arguments: a. Suffix to be replaced b. Replacement suffix By the end of this course students will attain the following learning outcomes. Students successfully completing the course will be able to: • shell programming using filters (including grep, egrep, fgrep) • write a shell script to validate the entered date. (eg. Date format is : dd=mm-yyyy) • write a shell script to check entered string is palindrome or not. • write a nawk program uncomment awk which removes any comment from a C program. • write an awk program using function, which capitalizes each word in a given string. • write an outper of the course screation using C. (Use of gec compiler) • use of g++ compiler. Content This course introduces operating system act as an intermediary between the user of a computer and computer hardware. The purpose of an operating system is to provide an environment in which a user can execute programs in a convenient and efficient manner. An operating system is a software that manages the computer hardware. The hardware is Describe Basic Organization of Computer Systems Define Operating system, functions, history and Evolution Define assembler, linker, loader, compiler Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Reading list Basic Literature: 1. Operating Systems Achyut S. Godbole Tata McGraw Hill 2nd edition. 2. Operating Systems Design & implementation Andrew S. Tanenbam, Albert S. Woodhull Pearson. Supplementary lite	nded learning	• Study of Advance commands of Linux.						
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10.UNIX – Sumitabha Das 11.Unix Shell Programming – Yashwant Kanetkar		1992.						
		10.UNIX – Sumitabha Das 11.Unix Shell Programming – Yashwant Kanetkar						
BPB publications.		BPB publications.						

Module name:	Computer Networks									
Code										
Trimester	5									
Person	Kuat Beisekeyev									
responsible	Aigerim Kalikova									
for the module	Balzhan Azibek									
Lecturer(s)	Kuat Beisekeyev, MSc									
	Aigerim Kalikova, MSc									
	Laura Aldasheva, Candidate Technical Sciences									
	Balzhan Azibek, M.Sc.									
Language	English									
Relation to	Bachelor programs: Software Engineering, Computer Science									
curriculum	Compulsory course.									
Type of teaching	Lectures serve to introduce new concepts and provide theoretical and									
	methodological foundations.									
	Practice sessions (seminars) are active sessions to develop student's									
	confidence through new examples and discussions on the problems.									
	Instructor-supervised independent study (ISIS) deals with review ar									
	exploration in greater depth of the course material.									
	Student's independent study (SIS): Self-study time including the time									
	required to pr	repare for and	complete all o	cours	e asses	sment	ts.			
Workload of		1			1	1				
course components	ECTS Con		ntact hours		ISIS	SIS	Total			
and credits per	credits	Lectures	Practice	ractice			hours			
trimester			sessions							
	5	30	20		10	90	150			
Course assessment										
and forms of	Period	Assessment	Number	Exa	am For	m	Schedule			
examination		type	of points	of points			(Week #)			
	1^{st}	Assignments	s 70	Sub	omissio	n of	Weekly			
	attestation			written						
				rep	eports					
		Mid-term	30	Written			5 th week			
		Exam								
		1 st 100								
		attestation								
		total								
	2nd attestation	Assignments	s 70	Submission of Weekly written			Weekly			
				rep	orts					
		End-term	30	Wr	itten		10 th week			
		Exam								
		2 nd	100							
		attestation								
		total								
	Final Exam		100	Written			During			
							final exam			
							session			
	Cumulative total for the course = $0.3 * 1^{st} Att + 0.3 * 2^{nd} Att + 0.4*Final = 100.$									
--	---	--	--	--	--	--				
Requirements	Course and university policies include:									
according to the examination regulations	Attendance is mandatory. Missing 30% of lessons will result in F (Fail)									
	grade (or summer school).									
	Late submissions are not accepted.									
	No cheating, duplication, falsification of data, plagiarism, and crib									
	Contacting the Lecturer : students are welcome to arrange one-to-one meetings with the teacher during office hours to discuss the class.									
Recommended prerequisites	 Prerequisite for this course is an intermediate level of understanding of personal computers and operating systems equivalent to the A + / IT Fundamentals levels. Basic computer literacy Basic PC operating system pavigation skills 									
	Basic internet usage skills									
	• Introduction to Programming (Java, Python, C++)									
Module	By the end of this course students will attain the following learning									
objectives/intended	outcomes.									
learning outcomes	The student will show a working knowledge in:									
	Common network components, architectures, and designs									
	• IPv4 and IPv6 structure, basic and advanced subnetting									
	• Ethernet switching technologies, Virtual LANs, STP									
	• OSI and TCP/IP layers in detail to understand their functions and									
	services									
	Students will have the skills to									
	• understand both the practical and conceptual skills to design and analyze computer communication networks.									
	build small and medium scale network topologies									
	• perform configurations for routers and switches									
	• examine IPv4 and IPv6 structure, basic and advanced subnetting									
	and implement IP addressing schemes									
	• cover Ethernet switching technologies, Virtual LANs, STP									
	• understand Network automation tools and latest Cisco products									
	In terms of Competences, students will be able to									
	• Critical Ininking: In the assignments, students are asked to evaluate the data and information critically: solve complex technical									
	problems and challenging tasks and manage the issues									
	• Problem-solving: Students demonstrate proficiency in managing									
	network essentials requirements on Packet Tracer									
	• Result-Orientation: Students improve the performance of									
	networking devices and their security on virtual machines or using packet									
	tracer tools.									
	• Documentation: Students learn how to understand different									
	documents as well as standards.									

	• Teamwork, collaboration, and communication: Students improve
	creative research and teamwork skills by performing individual/group
	• Career hard skills: Students learn relevant popular tools used in
	practice.
	• Research skills: The course uses elements of ROS for students to
	advance their interpretation and research skills.
Content	This course covers the fundamental building blocks that form a modern
	network, such as protocols, topologies, hardware, and network
	operating systems. Moreover, to provide in-depth coverage of the most
	important concepts in contemporary networking, such as TCP/IP,
	Ethernet, wireless transmission, and security.
	1 opics include: Week 1 Networking today:
	Week 2 – Cisco IOS:
	Week 3 – Network Protocols and models:
	Week 4 – Physical Laver Protocols and Data Link Laver Protocols:
	Week 5 – Ethernet Protocols and ARP;
	Week 6 – Network Layer Protocol;
	Week 7 – IPv4, Ipv6 Network Addresses;
	Week 8 – Subnetting an IPv4 Network;
	Week 9 – Transport Layer;
M. 1 1 1	Week 10 – Application Layer Protocols and QOS.
Media employed	Multimedia classrooms equipped with computer, projection, and audio system; Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	Basic Literature:
	1. Computer Networks, Global Edition 6th Edition 2021- Andrew Tanenbaum, David Wetherall.
	2. Computer Networks: A Systems Approach (The Morgan Kaufmann Series in Networking) 6th Edition 2021- Larry L. Peterson, Bruce S. Davie.
	Sunnlementary literature:
	1. Computer Networking: A Top-Down Approach, 6Th Edn, 2021
	2. Mayers Mike. CompTIA A+ Certification : All-in-One Exam Guide
	/ M. Mayers, S. Jernigan 10 ed San Francisco : McGraw-Hill
	Education, 2019 1524 p ISBN 978-1-260-45403-1 : 25500.00. 004 -
	3. Gary A. Donabue – Network Warrior, Second Edition
	4. CISCO Networking Academy Program CUNA I and 2 Companion Guide
	5. CCNA 200-301 Official Cert Guide Volume 1
	6 James F Kurose Keith W Ross-Computer Networking: A Ton-Down
	0.Junes I. Kurose, Kenn W. Koss-Computer Networking. A Top-Down
	Approach, 6Th Edn, 2021

Module name: Statistics and Data Science 1
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Code								
Trimester	5							
Person	Assistant Professor Beibit Abdikenov, PhD							
responsible								
for the module								
Lecturer(s)	Assistant Pro	fessor Beib	it Abdik	cenov.	PhD			
(_)								
Language	English							
Relation to	Bachelor pros	gramme: Bi	ig Data	Analys	is.			
curriculum	Compulsory	course.	0	2				
Type of teaching	Lectures serv	ve to introdu	ice new	concep	ts and	l provide	theoretical	and methodological
51 8	foundations.			1		1		0
	Practice sess	sions (semi	inars) a	re activ	ve ses	ssions to	develop st	tudent's confidence
	through new	examples a	nd discu	issions	on the	e problen	ns.	
Workload of								
course	ECTS	Contact h	ours		Tota	al hours]	
components and	credits	Lecture	Practi	ce	1			
credits per		s	sessio	ns				
trimester	5	20	30		50			
		•	•				3	
Course								
assessment and	Period	Assessme	ent	Numł	ber	Exam F	Form	Schedule
forms of		type		of poi	nts			(Week #)
examination	1 st	Assignme	ent 1	40 Submis		Submis	sion of	5 th week
	attestation					written reports		
				v		with co	des	
		Midterm	Exam	60		Written	1	5 th week
		1 st attestation		100				
		total						
	2nd	Assignme	ent 2	40		Submis	sion of	10 th week
	attestation					written	reports	
					with codes		odes	
		Endterm 1	Exam	60		Written		10 th week
		$2^{n\alpha}$ atte	station	100				
		total		100				
	Final Exam			100		Written	1	During final
								exam session
		4 . 4 . 1 . 6 41.		0.2	k 1st a	4 0 2 8	and A 44 1 4	0.4*E:1 100
Description	Cumulative	total for the	e course	= 0.3		tt + 0,3	$^{\prime} 2^{\rm au}$ Att + (0,4*Final = 100.
Requirements	Course and	universit	y polic	ies inc	lude:			
according to the	Attendance	is manda	tory. N	lissing	g 30%	o of less	ons will r	esult in F (Fail)
examination	grade (or su	immer scl	hool).					
regulations	Late submis	sions are n	ot acce	pted.				
	No cheating	g, duplicat	tion, fa	lsificat	tion o	of data, j	plagiarisn	n, and crib
	Contacting	the Lectu	rer: stu	idents	are w	elcome	to arrange	one-to-one
	meetings wi	th the teac	her dur	ing off	ĩce h	ours to d	liscuss the	class.
	_			-				
Recommended	Calculus 1, C	alculus 2, I	Linear A	lgebra,	Intro	duction t	o Programi	ming.
prerequisites							-	
Module	By the end of	By the end of this course students will attain the following learning outcomes.						
objectives/inten								
	The student	will show a	a worki	ng kno	wledg	ge in:		

ded learning	- main summary statistics, measures of location, measures of spread, percentiles,
outcomes	outliers.
	- Normal distribution, z-score, approximation of Normal distribution.
	- statistical inference, confidence intervals (estimation), hypothesis testing.
	- multiple regression, dummy variables, logistic regression.
	Students will have the skills to:
	- perform above statistical analysis using built-in statistics library, and other
	packages SciPy, Statmodels and NumPy.
	- learn basics of Machine Learning models.
	- perform scatter plot, linear correlation, linear regression,
	- identify coefficient of determination, significance of coefficients.
	In terms of Competences, students will be able to
	- Perform statistical analysis on given subject area
	- Perform regressional analysis, classifications and clustering of data by
	generic features
	- Apply data science tools to solve given problems
Content	This is a 10-week course, which focuses on improving understanding of statistics and
	enhancing python skills. These two aspects are necessary to develop before moving
	to Data Science.
	Statistics is a fundamental knowledge and contains basic models such as regression, which will be a starting point for most of the ML algorithms. While puthon is the
	most used language of Data Scientist, because it has substantive number of helpful
	libraries, huge number of contributors, and it is user friendly language. To develop
	statistical thinking on python, the following packages will be covered for statistical
	analysis: Statmodels, SciPy, NumPy and built-in statistics library.
Media employed	Multimedia classrooms equipped with computer, projection and audio system;
	Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	Assigned reading materials and presentations should be read prior to class. Class
	lectures and discussions will proceed with supplemental and advanced topics, which
	could be difficult to understand unless students have read the assigned material.
	the course will be reflected in the Learning Management System
	(moodle astanait edu kz)
	Basic Literature:
	1. Lecture presentations.
	Supplementary literature:
	1. Python for Data Analysis, Wes McKinney.
	2. Data Science from Scratch, Joel Grus.
	3. Python Data Science Handbook, Jake VanderPlas.
	4. Think Stats, Allen D. Downey.
	5. Introduction to Statistics, David M. Lane.
	6. Probability and Statistics for Data Science, Carlos Fernandez-Granda

Module name:	Advanced Programming
Code	
Trimester	5
Person responsible for the module	Senior-lecturer S. Yeleu, MSc
Lecturer(s)	Senior-lecturer S. Yeleu, MSc

Language	English							
Relation to	Bachelor programmes: Big Data Analysis, Software Engineering. Elective course.							
curriculum								
Type of teaching	Lectures serv	Lectures serve to introduce new concepts and provide theoretical and methodological						
	foundations.							
	Practice sess	sions (semi	inars) a	re activ	ve ses	sions to	o develop s	student's confidence
	through new	examples a	nd discu	issions	on the	proble	ns.	
	Instructor-su	ipervised i	ndepen	dent st	udy (I	SIS) de	als with rev	view and exploration
	in greater dep	oth of the co	ourse ma	aterial.	10			
	Student's in	dependent	study (SIS): S	elf-stu	idy time	e including	the time required to
W/1-11f	prepare for a	nd complete	e all cou	rse asse	essmei	nts.		
workload of								
course	ECIS	Lootumo	Dra oti	rs	1919	515	Total nou	rs
components and	credits	Lecture	Practi	ce				
trimester	5	s 20		$\frac{\text{ns}}{0}$	10	00	150	
timester		20	3	0	10	90	130	
Course								
course	Deriod	Assessme	nt	Numb	or	Exam	Form	Schedule
forms of	renou	type	-11 t	of poi	nte	Exam	I'OIIII	(Week #)
examination	1 st	Ouiz 1		333	nts	Writte	n	2 rd week
examination	attestation	Quiz 1		22.2		Writto	n	5 week
		Quiz 2	nt 1	22.2		Writto	[] n	3 week
		Assignme		33,3		writte	11	4 week
		1 st attesta	ation	100				
	2md	lotal		22.2		Writta		7th weels
	2110	Quiz 5		33,5		writte	11	/ Week
	allestation	Quiz 4		33,3		written		9 th week
		Assignme	ent 2	33,3		Writte	n	8 th week
		2 nd attestation 100						
		total						
	Final Project100Submission ofDuring f						During final	
						writtei	n report	exam session
		() 1 C (1		0.2	↓ 1 et A		* Ond A	0.4*5' 1 100
	Cumulative	total for the	e course	e = 0,3	* 1ª A	tt + 0,3	* 2 nd Att +	0,4*Final = 100.
Doquiromonto	Course and	minarit	v nalia	iog in al	ludar			
Requirements	Course and	universit	y pone	les inc	luae:			
according to the	Attendance	is manda	tory. N	lissing	30%	of less	ons will r	esult in F (Fail)
examination			55-55-56	8				
regulations	grade (or su	ımmer scl	nool).					
	Late submis	sions are n	not acce	pted.				
	No cheating	, duplicat	ion, fa	lsificat	ion o	f data.	plagiarisi	n, and crib
	2	, . r	-)			,	r	,,
	Contacting	the Lectu	rer: stu	idents a	are we	elcome	to arrange	e one-to-one
	meetings wi	th the teac	her dur	ing off	ice ho	ours to	discuss the	e class.
	_							
D 1.1	T	C 1 1		1	T., i	4. D	•	
Recommended	Linear Algeb	ra, Calculus	s I, Calc	ulus II,	Intro	to Prog	rammıng.	
prerequisites	Dy the cr. 1 - 4	this acres	atradam	to xx211 -	ttoin	ha fall.	wine lesse	ing outcomes
objectives/inter	By the end of	unis course		is Will 8	utain t		wing learn	ing outcomes.
objectives/inten	i ne student	will show a	a wurkl	ng KHO	wieug	с ш:		

ded learning	• Machine learning basics including task types with examples;						
outcomes	• Differences between supervised and unsupervised learning;						
	• Regularization techniques for neural networks:						
	• Concept of backpropagation:						
	 Different activation functions and initialization methods: 						
	• Concept of Convolutional Neural Networks and transfer learning:						
	• Recurrent neural networks:						
	• Natural Language Processing problem and solutions:						
	• Concepts of autoencoders and GANs.						
	Students will have the skills to						
	• train simple neural networks using TensorFlow;						
	• plot accuracies and losses for neural networks during training;						
	• visualize weights for images to interpret results of neural network trainings;						
	• use TensorFlow.js to create image classifier using transfer learning and own						
	data						
	In terms of Competences, students will be able to						
	• Identify the appropriate architecture to use for training neural networks;						
	• Use deep learning to solve real-world problems;						
	• Create a deep learning project from the beginning.						
Content	This course covers the fundamentals of applied deep learning and is related to computer science engineering. Topics include: machine learning basics, introduction to deep neural networks, Convolutional neural networks, transfer learning, Recurrent neural networks, Autoencoders, GANs, Natural Language Processing.						
Media	Multimedia classrooms equipped with computer, projection and audio system;						
employed	Whiteboard; Microsoft Teams; LMS Moodle.						
Reading list	Basic Literature:						
C C	1. Ian Goodfellow, Yoshua Bengio and Aaron Courville. Deep Learning. 2016,						
	MIT press.						
	2. Aurélien Géron. Hands-on Machine Learning with Scikit-Learn, Keras and						
	TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems. 2nd ed.,						
	O'Reilly, 2019.						

Module name:	Native Mobile Development
Code	
Trimester	5
Person responsible for the module	Amanbek Yerasyl
Lecturer(s)	Amanbek Yerasyl MSc.
Language	English
Relation to curriculum	Bachelor programmes:
	6B06101 Computer Science
	6B06102 Software Engineering
	6B06103 Big Data Analysis
	Elective course
Type of teaching	Lectures serve to introduce new concepts and provide theoretical and methodological
	foundations.

	 Practice sessions (seminars) are active sessions to develop student's confidence through new examples and discussions on the problems. Instructor-supervised independent study (ISIS) deals with review and exploration in greater depth of the course material. Student's independent study (SIS): Self-study time including the time required to prepare for and complete all course assessments. 							
Workload of								
course	ECTS	Cont	act hou	rs	ISIS	SIS	Total hou	rs
components and	credits	Lecture	Practi	ce		~~~~		
credits per		S	sessio	ns				
trimester	5	20	3	0	10	90	150	
				-				
Course		1		1				·
assessment and	Period	Assessme	ent	Numb	ber	Exam	Form	Schedule
forms of		type		of poi	nts			(Week #)
examination	1 st	Assignme	ent 1	20		Submi	ssion of	2 nd week
	attestation	Assignme	ent 2	20		Apps		3 rd week
		Assignme	ent 3	20				4 th week
		Mid-term	Exam	40		Oral D	Defence	5 th week
		1 st attesta	ation	100				
		total	total					
	2nd	Assignme	ent4	20		Submi	ssion of	6 th week
	attestation	Assignme	ent5	20		Apps		7 th week
		Assignme	ent6	20				8 th week
		Assignment7 +						9 th week
		End-term	Exam	40		Oral D	Defence	10 th week
		2 nd attestation		100				
	Einel Exem	total		100		Comm	ar arom	During fingl
	Final Exam		100		(MCO	+Practice)	During final exam session	
						CAIII SESSIOII		
	Cumulative	umulative total for the course = $0.3 * 1^{st} Att + 0.3 * 2^{nd} Att + 0.4*Final = 100.$						
Dequinamente								
according to the examination regulations	Course and university policies include: Attendance is mandatory. Missing 30% of lessons will result in F (Fail) grade (or summer school). Late submissions are not accepted. No cheating, duplication, falsification of data, plagiarism, and crib Contacting the Lecturer: students are welcome to arrange one-to-one meetings with the teacher during office hours to discuss the class.							
Recommended prerequisites	-							
Module	By the end of	this course	e studen	ts will a	ttain t	he follo	wing learn	ing outcomes.
objectives/inten	The student	will show a	a worki	ng kno	wledge	e in:		
ded learning	• under	standing a	nd dem	onstrati	ng the	skill i	n developr	nent of iOS mobile
outcomes	applications	standing a	na aom	onstrati	ng the		ii developi	
0.000000000	• imple	menting h	sic MV	C archi	tecture	natter	n in iOS pro	niect
	• imple	monting D	alagatio	c arcin	aka bat	by pattern	n in 105 pro podulos of 3	iOS project
	• mpt	• implementing Delegation of Tasks between modules of iOS project,						
	 Swift programming language at least at intermediate level 							

1									
	• working with API								
	Students will have								
	a solid background in ioS application development principles for computer								
	science, media technologies and software engineering students, in preparation either								
	for a job in industry or for more advanced courses at the graduate level.								
	In terms of Competences, students will be able to								
	• Work with RestAPI								
	Install and use third party libraries								
	Create complex UI screens								
	• Work with Firebase								
	• Present a general understanding of the programming language SWIFT								
	This course covers mobile application development principles and techniques using								
	SWIFT. Topics include basics of the Swift programming language and principles of								
	creating UI on iOS platform. This course also covers basic concepts for software								
	design and reuse.								
Media	Multimedia classrooms equipped with computer, projection, and audio system;								
employed	Whiteboard; Microsoft Teams; LMS Moodle, RestAPI.								
Reading list	Basic Literature:								
	14. Lecture slides (available on moodle.astanait.edu.kz);								
	2. Christian Keur. iOS Programming: The Big Nerd Ranch Guide / K. Christian, H.								
	Aaron 7 ed USA : Big Nerd Ranch, 2020 506 p ISBN 9780135264027 :								
	28900.00. 004.42 - K 40								
	Supplementary literature:								
	5. Android Programming / M. Kristin [и др.] 4 ed USA : Big Nerd Ranch,								
	2019 657 p ISBN 978-0135245125 : 24700,00. 004.42 - M 34								
	6. Ananth Grama.Parallel Algorithms in Computational Science and								
	Engineering / G. Ananth, H.S. Ahmed Houston : Springer, 2020 417p ISBN								
	978-3-030-43738-1 : 38600.00.004.42 - G 71								

6th term

Module name:	Sociology
Code	
Trimester	6
Person	Senior lecturer Kusmanova Assem, M.Sc.
responsible	
for the module	
Lecturer(s)	E.Otar, PhD.
	A.Kusmanova, M.Sc.
	A.Nurkanat, M.Sc.
	A.Zhanadilova, M.Sc.
	K.Issayeva, M.Sc.
Language	English
Relation to	Bachelor programmes: All
curriculum	Compulsory course.
Type of teaching	Lectures serve to introduce new concepts and provide theoretical and methodological
	foundations.
	Practice sessions (seminars) are active sessions to develop student's confidence
	through new examples and discussions on the problems.

	Instructor-s in greater dep Student's in prepare for an	upervised in oth of the co dependent nd complete	ndepen ourse ma study (e all cou	dent st aterial. SIS): S urse asso	udy (I elf-stu essmer	SIS) de 1dy time 1ts.	als with rev e including	iew and exploration the time required to
Workload of								
course	ECTS	Cont	act hou	rs	ISIS	SIS	Total hou	rs
components and	credits	Lecture	Practi	ce				
credits per		S	sessio	ns				
trimester	2	10	1	0	10	30	60	
Course		1		1				
assessment and	Period	Assessme	ent	Numb	ber	Exam	Form	Schedule
forms of		type		of poi	nts			(Week #)
examination	1^{st}	Assignme	ents	20		Prepar	ing of	Weekly
	attestation					presen	tations,	
						defens	e of	
		261	F	10		presen	tations	Eth 1
		Mid-term	Exam	10		Resear (theore	ch project etical part)	5 th week
		1 st attesta total	ation	100				
	2nd	Assignme	ents	20		Prepar	ing of	Weekly
	attestation	0		-		presen	tations,	5
						defens	e of	
						presen	tations	
		End-term	Exam	10		Resear	ch project	10 th week
						(practi	cal part)	
		2 nd attest	ation	100				
	Final Exam			100		Quiz		During final exam session
	Cumulative	total for the	e course	e = 0.3	* 1 st A	tt + 0.3	* 2 nd Att +	0,4*Final = 100.
				,		,		,
Requirements according to the examination	Course and Attendance	universit is manda	y polic tory, N	ies inc Tissing	lude: 30%	ofless	sons will r	esult in F (Fail)
regulations	grade (or si	ımmer scl	hool).	1.55118	, 00 / 0	01 105		
	I ate submis	sions are n	not acce	ented				
	No cheating	dunlicat	tion fa	lsificat	ion of	f data	nlagiarist	n and crih
	Contacting	the Lectu	rer: sti	idents :	are we	elcome	to arrange	one-to-one
	meetings wi	th the teac	her dur	ing off	ice ho	urs to	discuss the	
			ner dur	ing on		uis to .		01055.
Recommended	Culture Studi	ies						
Module								
objectives/inten	By the end of	f this course	e studen	ts will s	uttain t	he follo	wing learni	ng outcomes
ded learning	The student	will show s	a worki	ng kno	wledg	e in:		ing outcomes.
outcomes	• theor	ies and ann	roaches	to the s	study o	of societ	v and its su	lbsystems:
	• form	ation of ides	as about	the has	ic nrin	ciples	f functionir	ng of modern society
	and its social	institutions			•• Priii		- 19110101111	5 of modelin Society
	• under	rstanding th	<u>e rel</u> atio	onship b	<u>betwee</u>	en socie	ty, <u>scie</u> nce,	and technology;

	• developing skills to describe and analyze current problems of modern society,
	the essence of social processes and relations;
	• mastering by students of the main sources and methods of obtaining
	sociological information;
	• instilling the skills of using the knowledge gained in the process of
	assimilating sociology in professional activity;
	• developing critical thinking skills and the ability to apply them in practice.
	Students will have the skills to
	 Fead and understand a range of sociological texts and articles listening to leatures, presentations and interviews
	Insteming to rectures, presentations and interviews
	participating in group discussions
	 access and take part in informal discussions prepare and give poster presentations
	 prepare and give poster presentations develop team working skills to prepare presentations
	recognize and use sociological terms categories and concepts
	 improve self-study and ICT skills
	 develop research skills and critical thinking
	 develop research skills and critical dilliking develop self and peer evaluation skills
	• present reasoned and substantiated information about different stages of
	development of Kazakh society, social and interpersonal relations
	• analyze the features of the social institution in the context of their role in the
	modernization of Kazakh society
	• analyze of different situations in different spheres of communication from the
	position of correlation with the system of values, social, business, cultural, legal and
	ethical norms of Kazakhstani society
	By the end of this course students will be able to:
	• understand main sociological theories and concepts
	• Know basic themes in Sociology
	understand relationship between society, science, and technology
	read academic texts oritically read and discussion of academic articles
Content	This course is aimed to form a socio-humanitarian worldview of students in the
Content	context of solving problems of modernization of public consciousness. Additionally,
	the course introduces students to the present sociological studies on issues in science
	and technologies.
Media	Multimedia classrooms equipped with computer, projection and audio system;
employed	Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	Basic Literature:
	I. Ionja R. Conerly, Kathleen Holmes, Asha Lal Tamang, Jennifer Hensley, Jennifer
	L. Ifost, Pameia Alcasey, Kale McGonigal, Heatner Griffiths, Nathan Keirns, Eric Straver Tommy Sadler, Susan Cody Pydzewski, Gail Scaramuzzo, Sally Wyain, Jeff
	Bry Fave Jones (2021) Introduction to Sociology 3e
	2. Bruce C Straits (2018) Approaches to social reserach
	Supplementary literature:
	1. Giddens, A., & Sutton, P. W. (2017). Sociology (8th ed.). Polity Press.
	2. Brinkerhoff, D. B., Ortega, S. T., & Weitz, Professor of Sociology Rose. (2013).
	Essentials of sociology (9th ed.). Wadsworth Publishing.
	3. Ritzer G. Introduction to Sociology. SAGE, 2015.
	4. Giddens A. Introduction to Sociology. W.W. Norton & Company, 2014.
	5. Kendall D. Sociology in Our Times: The Essentials. Wadsworth Publishing, 2014.
	7. Schaefer R.T. Sociology in Modules / R.T. Schaefer. McGrawHill, 2016.

1	8. Meena, Sonam (2019) Durkheim and Sociological Method
	9. Social Forces (2018) Bauman and Contemporary Sociology: A Critical Analysis
	10. Simoni, Valerio Voirol, Jérémie (2021) Remittances and morality: family
	obligations, development, and the ethical demands of migration
	11. Farrugia, David Threadgold, Steven Coffey, Julia (2018) Young subjectivities
	and affective labour in the service economy

Module name:	Probability a	and Statisti	ics					
Code								
Trimester	6							
Person	Assoc. Prof. 1	M. Sergaziy	vev, PhI)				
responsible								
for the module								
Lecturer(s)	A Zhailaubek	MSc						
Lecturer(3)	A.Amanbekk	vzv. M.Sc.						
Language	English							
Relation to	Bachelor pro	grammes: H	Big Data	a Analy	vsis, S	oftware	Engineeri	ng, IT Management,
curriculum	Computer Sc	ience.						
	Compulsory	course.						
Type of teaching	Lectures serv	ve to introdu	ice new	concep	ts and	provide	theoretical	l and methodological
	Ioundations.	iona (aomi	nara) a	ra activ		ciona to	davalar	student's confidence
	through new	avamples a	nars) a	re activ	on the	sions to	ne develop s	student s confidence
	Instructor-si	inervised i	ndenen	dent st	ndv (1	(SIS) de	ns. als with rev	view and exploration
	in greater der	oth of the co	ourse ma	aterial.	uuy (I	515) 40		view and exploration
	Student's in	dependent	study (SIS): S	elf-sti	ıdy time	e including	the time required to
	prepare for an	nd complete	e all cou	rse asse	essme	nts.	U	I
Workload of								
course	ECTS	Cont	act hour	rs	ISIS	SIS	Total hou	ırs
components and	credits	Lecture	Practi	ce				
credits per		S	sessio	ns	1.0		1.50	
trimester	5	30	2	0	10	90	150	
Course								
assessment and	Period	Assessme	nt	Numb	ber	Exam	Form	Schedule
forms of		type		of poi	nts			(Week #)
examination	1 st .	Problem S	Sets	30		Submi	ssion of	Weekly
	attestation			20		writter	n reports	ard 1
		Quiz	D	30		Writte	n	5 th week
		Mid-term	Exam	40		Writte	n	5 th week
		1 st attesta total	ition	100				
	2nd	Problem S	Sets	30		Submi	ssion of	Weekly
	attestation					writter	n reports	
		Quiz		30		Writte	n	8 th week
		End-term	Exam	40		Writte	n	10 th week
		2 nd attest	ation	100				
		total						

	Final Exam	100	Written	During final
				exam session
	Cumulative total for the course	$e = 0,3 * 1^{s}$	$Att + 0,3 * 2^{nd} Att$	tt + 0,4*Final = 100.
Requirements	Course and university polic	ies includ	2:	
according to the	Attendance is mandatory. N	lissing 30	% of lessons wi	ll result in F (Fail)
examination	grade (or summer school).	_		
regulations	Late submissions are not acce	epted.		
	No cheating, duplication, fa	lsification	of data, plagiar	rism, and crib
	Contacting the Lecturer : stu	idents are	welcome to arran	nge one-to-one
	meetings with the teacher dur	ing office	hours to discuss	the class.
Recommended	Linear Algebra Calculus I Calc	ulus II Dis	crete mathematics	2
prerequisites		uius 11, Dis		
Module				
objectives/inten	By the end of this course studen	ts will attain	n the following lea	arning outcomes.
ded learning	The student will show a worki	ng knowled	lge in:	manage and annead of
outcomes	data:	simple data	sets, the central I	neasures and spread of
	Probability of various ev	vents; conce	epts of mutually ex	xclusive events;
	Conditional probabilitie	s, multiplic	ation rule, and Bay	yes theorem;
	Concepts of random var	riables, prol	pability distribution	ons, expected value and
	variance and their use in develop	ping statisti	cal inference tools	3;
	• Concept of a sampling	distribution	n and its use in s	statistical inference for
	• Intervals of confidence	for populati	on narameters:	
	Hypothesis testing inclu	iding a Chi-	Square test of inde	ependence, and concept
	of P-values in hypothesis testing	;	Square test of ma	ependence, und concept
	• Estimating the regressio	n line based	l on some data.	
	Students will have the skill to			
	 draw correct inferences 	from data s	ampling;	
	• construct confidence in	ntervals an	d formulate hypo	othesis tests involving
	population means, proportions a	nd variance	;	
	• formulate appropriate	statistical	hypotheses, and	to correctly interpret
	Statistical statements;	o II orror ar	d the role these er	rors play in interpreting
	results.		iu the fore these er	fors play in interpreting
	• measure the strength and	d direction	of a linear relation	ship with correlation.
	In terms of Competences stud	ents will h	e able to	
	Critically evaluate the d	ata and info	rmation:	
	• Use various test statistic	s to assess	the significance of	f a model;
	Employ confidence inte	rval and reg	gression analysis to	o construct a predictive
	model;			
	Use statistical technique	s in decisio	n making;	1 11 1 1 00
	• Interpret the results of s	tatistical an	alysis to real worl	a problems in different
Content	This course covers the fundament	ntal statistic	al concepts and is	related to the computer
	science engineering. Topics inc	lude: descr	iptive statistics; p	probability and random
	variables; sampling; statistical d	istributions	; confidence interv	vals; hypothesis testing;
	regression.			

Media employed	Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	Basic Literature:
	15. Walpole, Myers, Myers, Ye. Probability and Statistics for Engineers and
	Scientists. 9th edition. 2016, Pearson.
	16. Sheldon Ross. Introduction to Probability and Statistics for Engineers and
	Scientists. 5th edition. 2014, Elsevier.
	17. Sheldon Ross. First Course in Probability. 10th edition. 2019, Pearson
	Education.
	Supplementary literature:
	7. L. Wasserman. All of Statistics. Springer, 2005
	8. Lange, Applied Probability. Springer, 2015
	3. Jobson: Applied Muhivariate Data Analysis, Volume I: Regression and
	Experimental Design.

Module name:	Advanced Da	atabases (N	loSQL))				
Code								
Trimester	6							
Person responsible for the module	Aivar Sakhip	ov, MSc in	Comput	ter Scie	nce			
Lecturer(s)	Aivar Sakhip Eldiyar Zhan	ov, MSc in til <u>euov, MS</u>	Compu [*] Sc in Cy [*]	ter Scie b <u>er Phy</u>	ence, vsical a	and Soc	ia <u>l System</u> s	s
Language	English							
Relation to curriculum	Bachelor prog Compulsory	grammes: S course.	oftware	Engine	ering	, Compu	uter Science	e, IT Management.
Type of teaching	Lectures serve foundations. Practice sesses through new of Instructor-su in greater dep Student's inter prepare for all	ve to introdu sions (semi examples an upervised in oth of the cc dependent nd complete	ice new inars) a nd discu ndepen ourse ma study (e all cou	concep are activ assions dent st aterial. SIS): S arse asse	ts and ve ses on the udy (I self-stu	provide sions to problen (SIS) de udy time nts.	theoretical develop s ms. als with rev e including	l and methodological student's confidence view and exploration the time required to
Workload of							·	
course components and credits per	ECTS credits	Cont Lecture s	act hour Practic sessio	rs ce ns	ISIS	SIS	Total hou	ırs
trimester	5	20	3	0	10	90	150	
				<u> </u>		~ *		
Course				T				
assessment and	Period	Assessme	nt	Numb	ber	Exam	Form	Schedule
avamination	1 st			60 poi	nts	Theor	ation &	(Week #)
Crammation	attestation	Assignme	ints	00		Practic	cal Ouiz	2,3,4 weeks
		Mid-term	Exam	40		Writte	n	5 th week
		1 st attesta total	ition	100				

			-		
	2 nd attestation	Assignments	60	Theoretical & Practical Ouiz	7,8,9 weeks
	total	End-term Exam	40	Written	10 th week
		2 nd attestation	100		
	Einel Erren	total	100	Written	During fing1
			100	written	exam session
	Cumulative	total for the course	$e = 0,3 * 1^{st}$	Att + 0,3 * 2 nd Att -	+ 0,4*Final = 100.
Requirements according to the examination regulations	Course and Attendance grade (or su Late submiss No cheating Contacting meetings wi	university polic is mandatory. Nummer school). sions are not acce g, duplication, fa the Lecturer: stu th the teacher dur	ies include Aissing 30% epted. Isification udents are v ring office h	: 6 of lessons will of data, plagiaris velcome to arrang hours to discuss th	r esult in F (Fail) m, and crib e one-to-one e class.
Recommended	Database Ma	nagement Systems			
Module					
objectives/inten ded learning outcomes	By the end of The student Unde and Collection Work Quer Work Imple Students will students will perford databases; filter work install perford databases; Interms of C Defin NoSQL Data Graph). Evalu Demoload data, que	this course studen will show a worki erstanding Database ons; erstanding Relation king with Shell and ying Embedded Fie king with Indexes; ementation of all fe I have the skill to II and use MongoD orm CRUD (Create for data efficiently with both the Mon ase performance by the Aggregation Fra AongoDB Atlas - th the serverless platfo Competences, stud ne, compare and un bases (Document-co- uate NoSQL databa onstrate an understa ery data and perform	ts will attain ng knowled es, Collection s and Data M Server; elds & Array atures Mong B locally and e, Read, Up ; ngo Shell and y using index mework that he cloud solu rm (Stitch) of lents will be derstand ma priented, Key use developm anding of the mance tune b	the following learn ge in: ns and Documents, Modelling; 's; goDB offers to work d in the cloud (Mon date, Delete) opera d drivers (e.g. Node tes; t's built into Mongo tion offered by Mo offered by MongoD able to in characteristics of Value Pairs, Colum hent tools and progr e detailed architectu Document-oriented	ing outcomes. creating Databases with data efficiently goDB Atlas); ations on MongoDB .js driver); DB; ngoDB; B; Che four types of an-oriented and amming languages ire, define objects, NoSQL databases.
Content	This course c data model, i Framework. useful Mong	overs the fundament mporting data into In addition to these oDB tools and sen	ntals of Mong a cluster, we e essential to rvices as At	goDB, including Mo orking with CRUD opics, students will las, MongoDB's da	ongoDB's Document API and Aggregation learn and work with atabase as a service,

	MongoDB Compass, a schema visualization tool, as well as many other useful command-line utilities.
Media employed	Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	 Basic Literature: 18. T.Hills., NoSQL and SQL Data Modeling: Bringing Together Data, Semantics, and Software. Technics Publications, First edition, 2016, 258 p. 19. Carlos Coronel. Database systems / C. Carlos, M. Steven 13th Boston : Cengage Learning, 2019 781p ISBN 978-1-337-62790-0 : 24900.00. 20. P. Membrey, D. Hows & E. Plugge., MongoDB Basics. Apress, 1st ed. Edition, 2014, 158 p. 21. R. Copeland , MongoDB Applied Design Patterns: Practical Use Cases with the Leading NoSQL Database. O'Reilly Media, 1st edition, 2013, 244 p. 22. Vaish, Gaurav, Getting Started with NoSQL : Your Guide to the World and Technology of NoSQL, 2013 Supplementary literature: 1. Sadalage, P. & Fowler, NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence, Wiley Publications, 1st Edition ,2019. 2. Redmond, E. & Wilson, J., Seven Databases in Seven Weeks: A Guide to Modern Databases and the NoSQL Movement (1st Ed.). Raleigh, NC: The Pragmatic Programmers, LLC., 2012.

Module name:	Storage syste	ems						
Code								
Trimester	6							
Person	Yersultan Tu	lebayev, M	Sc in In	formati	on Sys	stems		
responsible								
for the module								
Lecturer(s)	Yersultan Tu	lebayev, MS	Sc in In	formati	on Sys	stems		
Language	English							
Relation to	Bachelor prog	grammes: 6	B06101	Softwa	are En	gineerir	ıg,	
curriculum	6B06103 Cor	nputer Scie	nce					
Type of teaching	Lectures serv	e to introdu	ice new	concep	ts and	provide	theoretical	and methodological
	foundations.							
	Practice sess	ions (semi	nars) a	re activ	ve ses	sions to	develop s	tudent's confidence
	through new	examples a	nd discu	issions	on the	probler	ns.	
	Instructor-su	ipervised i	ndepen	dent st	udy (I	SIS) de	als with rev	iew and exploration
	in greater dep	oth of the co	ourse ma	terial.				
	Student's in	dependent	study (SIS): S	elf-stu	idy time	e including	the time required to
	prepare for an	id complete	e all cou	rse asse	essmei	nts.		
Workload of								
course	ECTS	Cont	act hour	S	ISIS	SIS	Total hour	rs
components and	credits	Lecture	Practic	ce				
credits per		S	session	ns				
trimester	5	20	3	0	10	90	150	
Course								
assessment and	Period	Assessme	nt	Numb	ber	Exam	Form	Schedule
forms of		type		of poi	nts			(Week #)
examination	1 st	Laborator	v	30		Submi	ssion of	2 nd week
	attestation	works	•			writter	n reports	4 th week

			1		
		Quizzes	40	MCQ	2 nd week
		Mid town Exom	20	Waittan	4 th week
		1st attactation	30	written	5 ^m week
		1 st attestation total	100		
	2nd	Laboratory	30	Submission of	7 th week
	attestation	works		written reports	9 th week
		Quizzes	40	MCQ	8 th week 10 th week
		End-term Exam	30	Written	10 th week
		2 nd attestation	100		
	E's al Essent	total	100		Dearline Court
	Final Exam		100	MCQ Quiz	During final
					exam session
Paquiromonto	Cumulative	total for the course	$e = 0,3 * 1^{st}$	$Att + 0,3 * 2^{nd} Att -$	+ 0,4*Final = 100.
according to the examination	Attendance grade (or su	university polic is mandatory. N immer school).	Aissing 30%	: % of lessons will 1	result in F (Fail)
regulations	Late submis	sions are not acce	epted.		
	No cheating	g, duplication, fa	lsification	of data, plagiaris	m, and crib
	Contacting	the Lecturer: stu	idents are w	velcome to arrang	e one-to-one
	meetings wi	th the teacher dur	ring office h	ours to discuss th	e class.
Recommended	ICT or basic	computer knowled	ge, Database	Management Syste	ems
Module					
objectives/inten	By the end of	f this course studen	ts will attain	the following learn	ing outcomes
ded learning	The student	will show a worki	ng knowled	ge in:	ling outcomes.
outcomes	• Data	Storage, developm	nent of Stora	ge Technologies, d	levelopment trend of
	Storage Prod	ucts;		6 6 ,	1
	• Intell	igent Storage Com	ponents, RA	ID Technologies;	
	• Stora	ge Protocols: SCS	SI, iSCSI, F	C, FCoE, SAS an	d SATA, PCle and
	NVMe, RDN	AA and IB;			
	• Stora	ge Network Archit	ecture: DAS	, NAS, SAN;	
	• Stora	ge Resource Tunin	g Technolog	gies and Application	ns;
	• Stora	ge Data Protection	Technologie	es and Applications	;
	Back	up Solution Introdu	uction;		
	• DR S	olution Introductio	n;		
	• Stora	ge System O&M N	/lanagement.		
	Students wil	l have the skill to			
	• Deple	oy, operate, mainta	in, and mana	ige storage systems	;
	• Com	petent for enterpris	se storage en	gineers, IT technic	al support, and other
	positions;	. 1	Ũ	- ^	** ´
	• Unde	rstand and master	the knowled	lge and skills abou	t storage technology
	trends, storag	ge systems archite	cture, storag	e basic technologi	es, storage common
	advanced te	chnologies, storag	e service c	ontinuity solution	s, and basic O&M
	management	ot storage systems	La se de se 111 1	- h l - 4 -	
	In terms of C	ompetences, stud	ients will be	able to	and another C
	• Unde	rsiand now stora	ge supports	ne development	and application of
	Unung-euge	new technologies	(Such as Al,	Dig uata, ciouu cor	npunng),

	• Understand the key role of storage in the entire IT development;
	• Master storage ecosystem knowledge and have a more in-depth and
	systematic understanding of storage common technical knowledge;
	• Master business continuity technology and application knowledge, and have
	a deeper understanding of the data center backup solution and disaster recovery
	solution;
	• Perform data center storage management and maintenance operations.
Content	This course covers the fundamental data storage concepts and data storage
	technologies. Topics include: storage technologies, RAID technologies; storage
	protocols; storage system architecture; storage data protection; backup solution.
Media	Multimedia classrooms equipped with computer, projection and audio system;
employed	Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	Basic Literature:
Reading list	Basic Literature: 1. Lecture notes (available on https://moodle.astanait.edu.kz)
Reading list	 Basic Literature: 1. Lecture notes (available on https://moodle.astanait.edu.kz) 2. Introduction to Storage Area Networks and System Networking. Jon Tate, Pall
Reading list	Basic Literature:1. Lecture notes (available on https://moodle.astanait.edu.kz)2. Introduction to Storage Area Networks and System Networking. Jon Tate, PallBeck, Hector Hugo Ibarra, Shanmuganathan Kumaravel, Libor Miklas, IBM
Reading list	 Basic Literature: 1. Lecture notes (available on https://moodle.astanait.edu.kz) 2. Introduction to Storage Area Networks and System Networking. Jon Tate, Pall Beck, Hector Hugo Ibarra, Shanmuganathan Kumaravel, Libor Miklas, IBM Redbooks, 2018.
Reading list	 Basic Literature: 1. Lecture notes (available on https://moodle.astanait.edu.kz) 2. Introduction to Storage Area Networks and System Networking. Jon Tate, Pall Beck, Hector Hugo Ibarra, Shanmuganathan Kumaravel, Libor Miklas, IBM Redbooks, 2018. 3. Storage Systems. Organization, Performance, Coding, Reliability, and Their Data
Reading list	 Basic Literature: 1. Lecture notes (available on https://moodle.astanait.edu.kz) 2. Introduction to Storage Area Networks and System Networking. Jon Tate, Pall Beck, Hector Hugo Ibarra, Shanmuganathan Kumaravel, Libor Miklas, IBM Redbooks, 2018. 3. Storage Systems. Organization, Performance, Coding, Reliability, and Their Data Processing. Alexander Thomasian. 1st Edition - October 13, 2021.
Reading list	 Basic Literature: 1. Lecture notes (available on https://moodle.astanait.edu.kz) 2. Introduction to Storage Area Networks and System Networking. Jon Tate, Pall Beck, Hector Hugo Ibarra, Shanmuganathan Kumaravel, Libor Miklas, IBM Redbooks, 2018. 3. Storage Systems. Organization, Performance, Coding, Reliability, and Their Data Processing. Alexander Thomasian. 1st Edition - October 13, 2021. Supplementary literature:
Reading list	 Basic Literature: 1. Lecture notes (available on https://moodle.astanait.edu.kz) 2. Introduction to Storage Area Networks and System Networking. Jon Tate, Pall Beck, Hector Hugo Ibarra, Shanmuganathan Kumaravel, Libor Miklas, IBM Redbooks, 2018. 3. Storage Systems. Organization, Performance, Coding, Reliability, and Their Data Processing. Alexander Thomasian. 1st Edition - October 13, 2021. Supplementary literature: 1. Security and Data Storage Aspect in Cloud Computing (Studies in Big Data, 52)
Reading list	 Basic Literature: 1. Lecture notes (available on https://moodle.astanait.edu.kz) 2. Introduction to Storage Area Networks and System Networking. Jon Tate, Pall Beck, Hector Hugo Ibarra, Shanmuganathan Kumaravel, Libor Miklas, IBM Redbooks, 2018. 3. Storage Systems. Organization, Performance, Coding, Reliability, and Their Data Processing. Alexander Thomasian. 1st Edition - October 13, 2021. Supplementary literature: 1. Security and Data Storage Aspect in Cloud Computing (Studies in Big Data, 52) 1st ed. 2019 Edition by Prachi S. Deshpande, Subhash C. Sharma, Sateesh K.
Reading list	 Basic Literature: 1. Lecture notes (available on https://moodle.astanait.edu.kz) 2. Introduction to Storage Area Networks and System Networking. Jon Tate, Pall Beck, Hector Hugo Ibarra, Shanmuganathan Kumaravel, Libor Miklas, IBM Redbooks, 2018. 3. Storage Systems. Organization, Performance, Coding, Reliability, and Their Data Processing. Alexander Thomasian. 1st Edition - October 13, 2021. Supplementary literature: 1. Security and Data Storage Aspect in Cloud Computing (Studies in Big Data, 52) 1st ed. 2019 Edition by Prachi S. Deshpande, Subhash C. Sharma, Sateesh K. Peddoju.
Reading list	 Basic Literature: 1. Lecture notes (available on https://moodle.astanait.edu.kz) 2. Introduction to Storage Area Networks and System Networking. Jon Tate, Pall Beck, Hector Hugo Ibarra, Shanmuganathan Kumaravel, Libor Miklas, IBM Redbooks, 2018. 3. Storage Systems. Organization, Performance, Coding, Reliability, and Their Data Processing. Alexander Thomasian. 1st Edition - October 13, 2021. Supplementary literature: 1. Security and Data Storage Aspect in Cloud Computing (Studies in Big Data, 52) 1st ed. 2019 Edition by Prachi S. Deshpande, Subhash C. Sharma, Sateesh K. Peddoju. 2. Developments in Data Storage: Materials Perspective 1st Edition, Kindle Edition

Module name:	Statistics and Data Science 2						
Code							
Trimester	6						
Person responsible for the module	Assistant Professor Beibit Abdikenov, PhD						
Lecturer(s)	Assistant Pro	fessor Beib	it Abdikenov,	PhD			
Language	English						
Relation to curriculum	Bachelor programme: Big Data Analysis. Compulsory course.						
Type of teaching	Lectures serve to introduce new concepts and provide theoretical and methodological foundations. Practice sessions (seminars) are active sessions to develop student's confidence through new examples and discussions on the problems						
Workload of course							
components and	ECTS	Cont	act hours	ISIS	SIS	Total hours	
credits per trimester	credits	Lecture s	Practice sessions				
	5	20	30	10	90	150	
							-

Course					
assessment and	Period	Assessment	Number	Exam Form	Schedule
forms of		type	of points		(Week #)
examination	1 st	Assignment 1	40	Submission of	5 th week
	attestation			written reports	
				with codes	
		Midterm Exam	60	Written	5 th week
		1 st attestation	100		
		total	100		
	2nd	Assignment 2	40	Submission of	10 th week
	attestation	1 isoiginiteite 2		written reports	
				with codes	
		Endterm Exam	60	Written	10 th week
		2 nd attestation	100		
		total	100		
	Final Exam	totar	100	Written	During final
			100	() IIIIOII	exam session
					exam session
	Cumulative	total for the course	$= 0.3 * 1^{st}$	$Att + 0.3 * 2^{nd} Att + 0.3 *$	0 4*Final = 100
Requirements	Course and	university nolic	ies include	•	o, 1 1 mai 100.
according to the	Attendence	is mandatory N	lissing 309	• /. of lossons will r	osult in F (Fail)
examination	Attenuance	is manuatory. Iv	Insting 50 /	o ul lessuns will l	esuit in r (raii)
regulations	grade (or si	immer school).	. 1		
regulations	Late submis	sions are not acce	pted.		
	No cheating	g, duplication, fal	lsification of	of data, plagiarisr	n, and crib
	Contacting	the Lecturer: stu	idents are w	velcome to arrange	one-to-one
	meetings wi	th the teacher dur	ing office h	ours to discuss the	class.
Recommended	Calculus 1, C	Calculus 2, Linear A	Algebra, Intro	oduction to Program	ming, Statistics and
prerequisites	Data Science	1			
Module	By the end of	this course studen	ts will attain	the following learning	ng outcomes.
objectives/inten	The student	will show a worki	ng knowled	ge in:	
ded learning	- machine lea	rning algorithms su	ich as linear	regression,	
outcomes	- logistic regi	ession,			
	- KNNs,				
	- SVMs,				
	- Tree based	methods,			
	- ANNs,				
	- PCA.				
	- classificatio	n and clustering.			
	Students wil	I have the skill to:			
	- To perform	supervised learning	g, unsupervis	sed learning, and ser	n1-superv1sed
	learning.	1 1 1 1			1 (* 1
	- To understa	nd and implement	bias-variance	e tradeoff, feature se	lection and
	regularization	l.	1.1		1 /1 /1 1
	- To use SMC	JIE oversampling,	cross valida	tions, greed search,	and other methods
	of IVIL model	uning and modifie		abla ta	
	In terms of C	Joinpetences, stud	te as ¹	able to:	and magnessing
	- Professiona	i use basic models	to solve clas	sincation, clustering	and regression
	problems				- 1
Cantat	- Be able to n	noarry and implement	ent modified	methods of machin	e learning
Content	This is a 10	-week course, whi	ch tocuses	on improving deepe	er understanding of
	system-tocus	ed aspects of ma	chine learn	ing, covering guid	ing principles and
	commonly	used techniques	tor scaling	g up learning to	large data sets.
1	Intormally, it	will cover the tech	iniques that I	11e between a standa	rd machine learning

	course and an efficient systems implementation: both statistical/optimization techniques based on improving the convergence rate of learning algorithms and techniques that improve performance by leveraging the capabilities of the underlying hardware.
Media employed	Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	 Assigned reading materials and presentations should be read prior to class. Class lectures and discussions will proceed with supplemental and advanced topics, which could be difficult to understand unless students have read the assigned material. Readings are listed in the schedule section. All necessary updates and / or changes to the course will be reflected in the Learning Management System (moodle.astanait.edu.kz). <u>Basic Literature:</u> 2. Lecture presentations. <u>Supplementary literature:</u> 7. An introduction to Statistical Learning, G. James, D. Witten, T. Hastie, R. Tibshirani. 8. The Elements of Statistical Learning, T. Hastie, R. Tibshirani, J. Friedman. 9. Python Machine Learning, S. Raschka. 10. Data Science from Scratch, Joel Grus. 11. Python Data Science Handbook, Jake VanderPlas.

Module name:	Capstone project						
Code							
Trimester	6						
Person	Elvira Aitmul	khanbetova	, senior lecture	er			
responsible	Gulnur Shute	yeva, senio	r lecturer				
for the module							
Lecturer(s)	G.Shuteyeva,	senior lect	urer				
Language	English						
Relation to	Bachelor prog	grammes: I	Big Data Anal	ysis, So	ftware	Engineering,	IT Management.
curriculum	(Programmes	under acci	reditation are	listed)			
	Compulsory of	course.					
Tyme of teaching	Lasturas sam	to introdu		ta and m	marrida	theoretical on	d math a dala ai a al
Type of teaching	foundations	e to introdu	ice new concep	ots and p	orovide	theoretical and	amethodological
	Practice sess	ions (semi	nars) are acti	Ve cecc	ions to	develop stud	ent's confidence
	through new examples and discussions on the problems						
	Instructor-supervised independent study (ISIS) deals with review and exploration						
	in greater dep	th of the co	ourse material.		,		1
	Student's inc	lependent	study (SIS): S	Self-stud	ly time	e including the	time required to
	prepare for an	nd complete	e all course ass	essmen	ts.		
Workload of				1	1	1	-
course	ECTS	Cont	act hours	ISIS	SIS	Total hours	
components and	credits	Lecture	Practice				
credits per		S	sessions				
trimester	5	30	20	10	90	150	
Course							
assessment and							

forms	Deriod	Assessment	Number	Exam Form	Schedule	
evamination	renou	type	of points		(Week #)	
Crainination	1 st	Topic (plan)	20	Submission of	Weekly	
	attestation		20	written reports	WCCKIY	
		Project proposal	20	written reports	3 rd week	
		Weekly	20		A th week	
		progress (week	20		4 WCCK	
		1-4)				
		Progress report	40		5 th week	
		1 st attestation	100			
		total	100			
	2nd	Weekly	20	Submission of	Weekly	
	attestation	progress (week	20	written reports	weekiy	
		6-9)		wither reports		
		Progress report	40		8 th week	
		Final	2.0		9 th week	
		presentation	20		y week	
		Team	20			
		evaluation	-			
		2 nd attestation	100		10 th week	
		total				
	Final paper		100		During final	
					exam session	
	Cumulative	total for the course	$e = 0,3 * 1^{st}$	$Att + 0,3 * 2^{nd} Att$	+ 0,4*Final	
Requirements	Course and	university polic	ies include:			
according to the	Attendance	is mandatory. N	/lissing 30%	6 of lessons will 1	result in F (Fail)	
examination	grade (or su	ımmer school).				
regulations	Late submis	sions are not acce	epted.			
	No cheating	g, duplication, fa	lsification o	of data, plagiaris	m, and crib	
	Contacting the Lecturer: students are welcome to arrange one-to-one					
	meetings with the teacher during office hours to discuss the class.					
Recommended	Research Me	thod and tools				
prerequisites						
Module	D (1 1 1			.1	. ,	
objectives/inten	By the end of	this course studen	ts will attain	the following learn	ing outcomes.	
ded learning	I he student	will show a worki	ng knowledg	ge in: d mablem in talaar	mmunication	
outcomes	- design a sol	lamont debug and	nt open-ende	a problem in teleco	the selected much low	
	- design, imp	lement, debug, and	test created s	system that address	the selected problem	
	choose appr	corrigte theories an	d techniques	to address the prob	lem	
	- select an an	propriate evaluation	n methodolog	to address the prot	he solution meets the	
	design goals					
	- document a	nd present (using w	ritten, oral a	nd visual means) th	e design process and	
	the results of	a proposed solution	n to the selec	ted problem.	process und	
	- function eff	ectively in teams.		1		
	Students wil	I have the skill to				
	• Critic	cally reason and an	alyze a reaso	nably complex pro	blem;	
	• Use r	• Use research methodologies in solving complex problems;				
1						
	• Use a	ppropriate research	n tools, resou	rces and technolog	ies;	

	Prepare project paper, presentation.
	 In terms of Competences, students will be able to Students will be able to: address a theoretical, practical, real-world challenge. implement the plan activity individually as a team. select, collect and use required information/knowledge to solve the identified problem. design a solution to a significant open-ended problem in telecommunication. design, implement, debug, and test created system that address the selected problem using the skills learned in previous courses. take appropriate decisions based on collected and analyzed information.
Content	This course covers the fundamental statistical concepts and is related to the computer science engineering. Topics include: introduction to the course and policies; listing projects; project topics; project proposal; scope of the project; details of designs, working and processes; results and applications; conclusions and future scope; references and Bibliography; final presentation and final paper
Media employed	Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	Basic Literature:1. The Capstone Guidebook: A Step-by-Step Guide to Capstone Design and Writing– by Douglas L. Blakemore, Ph.D., 20122. Model-Based Processing - James V. Candy, 2019Supplementary literature:3. Elizabeth DePoy. Introduction to Research Understanding and Applying MultipleStrategies / D. Elizabeth, N. G. Laura 6 ed USA : Elsevier Inc., 2020 402 pISBN 978-0-323-61247-0 : 68200.00.303 - D35

Module name:	Research project
Code	
Trimester	6
Person	Elvira Aitmukhanbetova, senior lecturer
responsible	Gulnur Shuteyeva, senior lecturer
for the module	
Lecturer(s)	G.Shuteyeva, senior lecturer
Language	English
Relation to	Bachelor programmes: Big Data Analysis, Software Engineering, IT Management.
curriculum	(Programmes under accreditation are listed)
	Compulsory course.
Type of teaching	Lectures serve to introduce new concepts and provide theoretical and methodological
Type of teaching	foundations.
	Practice sessions (seminars) are active sessions to develop student's confidence
	through new examples and discussions on the problems.
	Instructor-supervised independent study (ISIS) deals with review and exploration
	in greater depth of the course material.
	Student's independent study (SIS): Self-study time including the time required to
	prepare for and complete all course assessments.

Workload of								
course	FCTS	Cont	act hou	rs	ISIS	SIS	Total hou	Irs
components and	credits	Lecture Practic		.13 .09		515	10tal liou	15
credits ner	cicuits			nc				
trimester	5	<u> </u>	303510	0	10	00	150	
unnester	3	50	2	20	10	90	130	
9								
Course		1.						~
assessment and	Period	Assessme	ent	Numl	ber	Exam	Form	Schedule
forms of		type		of po	ints			(Week #)
examination	1 st .	Assignme	ents	60		Submi	ssion of	Weekly
	attestation					writter	1 reports	
		Mid-term		40		Writte	n	5 th week
		1 st attesta total	ntion	100				
	2nd	Assignme	ents	60		Submi	ssion of	Weekly
	attestation	8				writter	reports	J
		End-term		40		Writte	n	10 th week
		2 nd attest	ation	100				
		total		100				
	Final Exam	Project		100		Manus	cript and	During final
		110,000		100		oral pr	esentation	exam session
				1		F-		
	Cumulative	total for the	e course	e = 0.3	* 1 st A	tt + 0.3	* 2^{nd} Att +	-0.4*Final = 100.
	Cumulative	totul for the	e e c c c c c c c c c c c c c c c c c c	. 0,5	1 11		2 1100	0,1 T IIIur 1001
Recommended	Academic W	riting, Rese	arch me	ethods a	and To	ols		
prerequisites		U,						
Module								
objectives/inten	By the end o	of this cours	e studer	nts will	attain	the foll	owing learn	ning outcomes.
ded learning	The student	will show	a work	ing kno	owledg	ge in:	0	0
outcomes	• para	digms that	research	ı devela	opment			
	• Navi	gate in rese	arch pro	ocesses	and co	nduct v	valuable res	earch projects
	• Expl	ore differe	nt wav	s to de	n rese	arch a	nd gain a	n understanding of
	auali	tative quan	ntitative	and m	ived-m	nethods	research	in understanding of
	Rring	the gained	l knowl	edae an	d ekille	s into a	researen etion for di	nloma works
	• Diniş	g the gamed	I KIIO WI	euge an	u skin	s mo a		piolila works
	Students wil	l have the c	skill to					
	A nol	vza a big pi	mbor o	flitor	turo D	00011700		
	Allal Defi	yze a olg ill		field	uure K	esource	5,	
	• Deni	le narrow re		field;				
	• Gene	rate Kesear	ch Que	stion(s)	;	D	1 5. 11	
	• Write	ng Researc	h Propo	osal for	Chose	n Resea	rch Field.	
	• Ident	ity Differen	nces bet	ween q	ualitati	ive and	quantitative	e methodologies.
	• Use of	different too	ols for c	itation,	for an	alyzing	survey and	future statistics.
	.	a .			••••			
	In terms of (ompetenc	es, stud	ients w	ill be a	ible to		
	• Critic	cally evalua	ite the d	lata and	inform	nation;	_	
	• Have	e a good cor	nmunic	ation a	nong g	group m	embers.	
	• Have	a problem-	-solving	g compe	tence	for solv	ing differer	nt kind of problems;
	• Inter	pret the res	ults of	surveys	(ques	tionnaiı	res) to som	e meaningful report
	and c	conclusion.						

Content	This course covers various concepts crucial to scientific research methodology, from the initial formulation of the problem through all the steps designing and conducting the research to the final stage of writing a report.
Media	Multimedia classrooms equipped with computer, projection and audio system;
employed	Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	Basic Literature:
	1. The Essential Guide to Doing Your Research Project, 3 rd edition, Zina O'Leary,
	SAGE Publications Ltd, 2017, ISBN-13: 978-1473952089
	2. The Capstone Guidebook: A Step-by-Step Guide to Capstone Design and Writing
	– by Douglas L. Blakemore, Ph.D., 2012
	3. Model-Based Processing - James V. Candy, 2019
	Supplementary literature:
	1. Elizabeth DePoy. Introduction to Research Understanding and Applying
	Multiple Strategies / D. Elizabeth, N. G. Laura 6 ed USA : Elsevier Inc.,
	2020 402 p ISBN 978-0-323-61247-0 : 68200.00.303 - D35
	2. Research Methodology: Tools and Techniques, 1 st edition, Dr. Prabhat Pandey,
	Bridge Center, 2015, ISBN-13: 976-6069350270

Module name:	Industrial Practice
Code	
Trimester	6 for the educational program Applied Data Analytics (Master)
Person	Turar Olzhas, PhD, Head of department
responsible	
for the module	
Lecturer(s)	-
Language	English, Russian
Relation to	Educational Program: Big Data Analysis
curriculum	Compulsory course
Type of teaching	Lectures serve to introduce new concepts and provide theoretical and methodological
	foundations.
	Practice sessions (seminars) are active sessions to develop student's confidence through new examples and discussions on the problems.
	Instructor-supervised independent study (ISIS) deals with review and exploration
	in greater depth of the course material.
	Student's independent study (SIS): Self-study time including the time required to
	prepare for and complete all course assessments.
Workload of	
course	
components and	
credits per	
trimester	
Course	
assessment and	

					1
forms of	Period	Assessment	Number	Exam Form	Schedule
examination		type	of points		(Week #)
	$ 1^{st}$	laboratory work	60	Submission of	Weekly
	attestation	1-4		written reports	
		Mid term Exam	40	Written	5 th week
		1 st attastation	100	Witten	JWCCK
		total	100		
	2nd	laboratory work	60	Submission of	Weekly
	attestation	5-8		written reports	5
		End-term Exam	40	Written	10 th week
		2 nd attestation	100		
		total	100		
	Final exem		100		During final
					exam session
	Cumulative	total for the course	$e = 0,3 * 1^{st}$	$Att + 0,3 * 2^{nd} Att -$	+0,4*Final=100.
	~				
Requirements	Course and	university polic	ies include	•	
according to the	Attendance	is mandatory. N	Aissing 30%	6 of lessons will	result in F (Fail)
regulations	grade (or si	ummer school).			
regulations	Late submis	sions are not acce	epted.		
	No cheating	g, duplication, fa	lsification	of data, plagiaris	m, and crib
	Contacting	the Lecturer: stu	idents are w	velcome to arrang	e one-to-one
	meetings wi	th the teacher dur	ring office h	ours to discuss th	e class.
Recommended	Introduction	to Programming, S	tatistics & D	ata Science 1.2	
Recommended prerequisites	Introduction	to Programming, S	tatistics & D	ata Science 1, 2	
Recommended prerequisites Module	Introduction	to Programming, S	tatistics & D	ata Science 1, 2	
Recommended prerequisites Module objectives/inten	Introduction By the end of	to Programming, S	tatistics & D ts will attain	ata Science 1, 2 the following learn	ing outcomes.
Recommended prerequisites Module objectives/inten ded learning	Introduction By the end of The student	to Programming, S f this course studen will show a worki	tatistics & D ts will attain ng knowled	ata Science 1, 2 the following learr ge in:	ning outcomes.
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end or The student - practical ap	to Programming, S f this course studen will show a worki plications of big da	tatistics & D ts will attain ng knowled tta analytics	ata Science 1, 2 the following learr ge in: in different industri	ning outcomes. al domains.
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end of The student - practical ap - requirement	to Programming, S f this course studen will show a worki plications of big da ts and constraints o	tatistics & D ts will attain ng knowled tta analytics f real-world	ata Science 1, 2 the following learr ge in: in different industri big data analytics p	ning outcomes. al domains. projects.
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end of The student - practical ap - requirement	to Programming, S f this course studen will show a worki plications of big da ts and constraints o	tatistics & D ts will attain ng knowled ta analytics f real-world	ata Science 1, 2 the following learr ge in: in different industri big data analytics p	ning outcomes. al domains. projects.
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end of The student - practical ap - requirement Students wil	to Programming, S f this course studen will show a worki plications of big da ts and constraints o I have the skill to	tatistics & D ts will attain ng knowled tta analytics f real-world	ata Science 1, 2 the following learr ge in: in different industri big data analytics p	ning outcomes. al domains. projects.
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end of The student - practical ap - requirement Students wil - Develop tea and industry	to Programming, S f this course studen will show a worki plications of big da ts and constraints o l have the skill to amwork and comm professionals	tatistics & D ts will attain ng knowled tta analytics f real-world unication sk	ata Science 1, 2 the following learr ge in: in different industri big data analytics p ills by collaborating	ning outcomes. al domains. projects. g with other students
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end or The student - practical ap - requirement Students wil - Develop tea and industry - Analyze the	to Programming, S f this course studen will show a worki plications of big da ts and constraints o I have the skill to amwork and comm professionals.	tatistics & D ts will attain ng knowled tta analytics f real-world unication sk constraints c	ata Science 1, 2 the following learr ge in: in different industri big data analytics p ills by collaborating	ning outcomes. al domains. projects. g with other students ta analytics projects.
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end of The student - practical ap - requirement Students wil - Develop tea and industry - Analyze the - Develop pro-	to Programming, S f this course studen will show a worki plications of big da ts and constraints o I have the skill to amwork and comm professionals. e requirements and oject management s	tatistics & D ts will attain ng knowled tta analytics f real-world unication sk constraints c skills, includ	ata Science 1, 2 the following learr ge in: in different industri big data analytics p ills by collaborating of real-world big dation ing planning, execu	ning outcomes. al domains. projects. g with other students ta analytics projects. uting, and monitoring
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end of The student - practical ap - requirement Students wil - Develop tea and industry - Analyze the - Develop pro big data analy	to Programming, S f this course studen will show a worki plications of big da ts and constraints o I have the skill to amwork and comm professionals. requirements and oject management s ytics projects.	tatistics & D ts will attain ng knowled ta analytics f real-world unication sk constraints c skills, includ	ata Science 1, 2 the following learr ge in: in different industri big data analytics p ills by collaborating of real-world big dat ing planning, execu	ning outcomes. al domains. projects. g with other students ta analytics projects. nting, and monitoring
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end or The student - practical ap - requirement Students wil - Develop tea and industry - Analyze the - Develop pro- big data analy	to Programming, S f this course studen will show a worki plications of big da ts and constraints o l have the skill to amwork and comm professionals. e requirements and oject management s ytics projects.	tatistics & D ts will attain ng knowled tta analytics f real-world unication sk constraints c skills, includ	ata Science 1, 2 the following learr ge in: in different industri big data analytics p ills by collaborating f real-world big dat ing planning, execu	ning outcomes. al domains. projects. g with other students ta analytics projects. uting, and monitoring
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end of The student - practical ap - requiremen Students wil - Develop tea and industry - Analyze the - Develop pro big data analy	to Programming, S f this course studen will show a worki plications of big da ts and constraints o I have the skill to amwork and comm professionals. requirements and oject management s ytics projects.	tatistics & D ts will attain ng knowled tta analytics f real-world unication sk constraints c skills, includ	ata Science 1, 2 the following learr ge in: in different industri big data analytics p ills by collaborating of real-world big da ing planning, exect	ning outcomes. al domains. projects. g with other students ta analytics projects. tting, and monitoring
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end or The student - practical ap - requirement Students will - Develop tea and industry - Analyze the - Develop pro- big data analy In terms of o - Gain practi	to Programming, S f this course studen will show a worki plications of big da ts and constraints o l have the skill to amwork and comm professionals. requirements and oject management s ytics projects. competences stude cal experience wit	tatistics & D ts will attain ng knowled tta analytics f real-world unication sk constraints c skills, includ ents will be a h big data a	the following learn ge in: in different industri big data analytics p ills by collaborating of real-world big da ing planning, execu able to: nalytics tools and	ning outcomes. al domains. projects. g with other students ta analytics projects. tting, and monitoring technologies used in
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end of The student - practical ap - requirement Students wil - Develop tea and industry - Analyze the big data analy In terms of c - Gain practi- industry.	to Programming, S f this course studen will show a worki plications of big da ts and constraints o I have the skill to amwork and comm professionals. requirements and oject management s ytics projects. competences stude cal experience wit	tatistics & D ts will attain ng knowled tta analytics f real-world unication sk constraints c skills, includ ents will be a h big data a	ata Science 1, 2 the following learr ge in: in different industri big data analytics p ills by collaborating of real-world big dat ing planning, execu able to: nalytics tools and	ning outcomes. al domains. projects. g with other students ta analytics projects. uting, and monitoring technologies used in
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end of The student - practical ap - requiremen Students wil - Develop tea and industry - Analyze the - Develop pro- big data analy In terms of c - Gain practi- industry. - Identify and	to Programming, S f this course studen will show a worki plications of big da ts and constraints o I have the skill to amwork and comm professionals. e requirements and oject management s ytics projects. competences stude cal experience wit d analyze ethical a	tatistics & D ts will attain ng knowled tta analytics f real-world unication sk constraints c skills, includ ents will be a h big data a nd legal con	the following learn ge in: in different industri big data analytics p ills by collaborating of real-world big da ing planning, execu able to: nalytics tools and siderations related	ning outcomes. al domains. projects. g with other students ta analytics projects. uting, and monitoring technologies used in to big data analytics
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end or The student - practical ap - requirement Students will - Develop tea and industry - Analyze the - Develop pro- big data analy In terms of c - Gain practi- industry. - Identify an- projects. - Develop sk	to Programming, S f this course studen will show a worki plications of big da ts and constraints o I have the skill to amwork and comm professionals. e requirements and oject management s ytics projects. competences stude cal experience wit d analyze ethical a	tatistics & D ts will attain ng knowled tta analytics f real-world unication sk constraints c skills, includ ents will be a h big data a nd legal con ical docume	the following learn ge in: in different industribig data analytics p ills by collaborating of real-world big dat ing planning, execu- able to: nalytics tools and siderations related	ning outcomes. al domains. projects. g with other students ta analytics projects. tting, and monitoring technologies used in to big data analytics writing.
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end of The student - practical ap - requirement Students wil - Develop tea and industry - Analyze the big data analy In terms of c - Gain practi industry. - Identify and projects. - Develop ski	to Programming, S f this course studen will show a worki plications of big da ts and constraints o I have the skill to amwork and comm professionals. requirements and oject management s ytics projects. competences stude cal experience wit d analyze ethical a ills related to techn	tatistics & D ts will attain ng knowled tta analytics f real-world unication sk constraints c skills, includ ents will be a h big data a nd legal con ical documen	the following learn ge in: in different industri big data analytics p ills by collaborating of real-world big dat ing planning, execu able to: nalytics tools and siderations related ntation and report w	ning outcomes. al domains. projects. g with other students ta analytics projects. ating, and monitoring technologies used in to big data analytics writing.
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end or The student - practical ap - requirement Students will - Develop tea and industry - Analyze the - Develop pro- big data analy In terms of c - Gain practi- industry. - Identify and projects. - Develop ski	to Programming, S f this course studen will show a worki plications of big da ts and constraints o I have the skill to amwork and comm professionals. e requirements and oject management s ytics projects. competences stude cal experience wit d analyze ethical a ills related to techn	tatistics & D ts will attain ng knowled tta analytics f real-world unication sk constraints c skills, includ ents will be a h big data a nd legal con ical documen	the following learn ge in: in different industribig data analytics p ills by collaborating of real-world big dating planning, execu- able to: nalytics tools and siderations related ntation and report w	ning outcomes. al domains. projects. g with other students ta analytics projects. tting, and monitoring technologies used in to big data analytics writing.
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end of The student - practical ap - requirement Students wil - Develop tea and industry - Analyze the - Develop pro- big data analy In terms of c - Gain practi- industry. - Identify and projects. - Develop ski Industrial pra-	to Programming, S f this course studen will show a worki plications of big da ts and constraints o I have the skill to amwork and comm professionals. requirements and oject management s ytics projects. competences stude cal experience wit d analyze ethical a ills related to techn actice organized in ata Engineering, Da	tatistics & D ts will attain ng knowled tta analytics f real-world unication sk constraints c skills, includ ents will be a h big data a nd legal con ical documen n IT compa ata Science c	the following learn ge in: in different industribig data analytics p ills by collaborating of real-world big dating planning, execu able to: nalytics tools and siderations related nation and report w nies, namely the j or Machine Learnin	hing outcomes. al domains. projects. g with other students ta analytics projects. atting, and monitoring technologies used in to big data analytics writing. jobs related to Data g usage is necessary.
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end of The student - practical ap - requirement Students wil - Develop tea and industry - Analyze the - Develop pro- big data analy In terms of c - Gain practi- industry. - Identify and projects. - Develop ski Industrial pra- Analytics, Da There will be	to Programming, S f this course studen will show a worki plications of big da ts and constraints o I have the skill to amwork and comm professionals. requirements and oject management s ytics projects. competences stude cal experience wit d analyze ethical a ills related to techn actice organized in ata Engineering, Da e a supervisor in th	tatistics & D ts will attain ng knowled tta analytics f real-world unication sk constraints of skills, includ ents will be a h big data a nd legal con ical document ical document n IT compa ata Science of he university	the following learn ge in: in different industribig data analytics p ills by collaborating of real-world big dating planning, execu- able to: nalytics tools and siderations related nation and report w nies, namely the jor Machine Learnin and the superviso	ning outcomes. al domains. projects. g with other students ta analytics projects. ating, and monitoring technologies used in to big data analytics writing. jobs related to Data g usage is necessary. r from the company,
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end or The student - practical ap - requirement Students will - Develop tea and industry - Analyze the - Develop pro- big data analy In terms of c - Gain practi- industry. - Identify and projects. - Develop sk: Industrial pra- Analytics, Da There will be contacting wi	to Programming, S f this course studen will show a worki plications of big da ts and constraints o I have the skill to amwork and comm professionals. requirements and oject management s ytics projects. competences stude cal experience wit d analyze ethical a ills related to techn actice organized in ata Engineering, Da e a supervisor in th th each other. Final	tatistics & D ts will attain ng knowled tta analytics f real-world unication sk constraints c skills, includ ents will be a h big data a nd legal con ical document n IT compa ata Science con he university grade of the l	the following learn ge in: in different industribig data analytics p ills by collaborating of real-world big dat ing planning, execu- tible to: nalytics tools and siderations related nation and report w nies, namely the j or Machine Learnin and the superviso industrial practice is	ning outcomes. al domains. projects. g with other students ta analytics projects. tting, and monitoring technologies used in to big data analytics writing. jobs related to Data g usage is necessary. r from the company, defined by university
Recommended prerequisites Module objectives/inten ded learning outcomes	Introduction By the end of The student - practical ap - requirement Students wil - Develop tea and industry - Analyze the - Develop pro- big data analy In terms of c - Gain practi- industry. - Identify and projects. - Develop ski Industrial pra- Analytics, Da There will be contacting wi supervisor ba	to Programming, S f this course studen will show a worki plications of big da ts and constraints o I have the skill to amwork and comm professionals. requirements and oject management s ytics projects. competences stude cal experience wit d analyze ethical a ills related to techn actice organized in the ach other. Final sed on student's rep	tatistics & D ts will attain ng knowled tta analytics f real-world unication sk constraints c skills, includ ents will be a h big data a nd legal con ical document n IT compa ata Science con the university grade of the D port	the following learn ge in: in different industribig data analytics p ills by collaborating of real-world big dating planning, execu- able to: nalytics tools and siderations related intation and report w nies, namely the j or Machine Learning and the superviso industrial practice is	hing outcomes. al domains. projects. g with other students ta analytics projects. iting, and monitoring technologies used in to big data analytics writing. jobs related to Data g usage is necessary. r from the company, defined by university

1							
	Introduction to big data analytics in industry						
	Hands-on experience with big data analytics projects						
	Requirements analysis and project planning						
	Big data analytics tools and technologies						
	Technical documentation and report writing						
Media	Multimedia classrooms equipped with computer, projection and audio system;						
employed	Whiteboard; Microsoft Teams; LMS Moodle.						
Reading list	1. O'Reilly Media, "Hadoop: The Definitive Guide", 4th Edition, 2015.						
	2. Michael Armbrust, Reynold Xin, Cheng Lian, Yin Huai, Davies Liu, Joseph						
	K. Bradley, Xiangrui Meng, Tomer Kaftan, and Matei Zaharia, "Spark SQL:						
	Relational Data Processing in Spark", ACM, 2015.						
	3. George Kesidis, "An Introduction to NoSQL Databases", 1st Edition,						
	CreateSpace Independent Publishing Platform, 2016.						
	4. Anne-Laure Fayard and John Weeks, "Working in Groups and Teams",						
	SAGE Publications, 2015.						
	5. Philip Jan Rothstein and Scott R. Harris, "Ethical and Social Issues in the						
	Information Age", Springer, 2014.						
P							

7th term

Module name:	Philosophy							
Code								
Trimester	7							
Person	Assoc. Prof. A	Ainur Abdir	na					
responsible	Assoc. Prof.	Gulmira Sh	eriyazda	anova				
for the module	Assoc. Prof.]	Mariyash Bozzigitova						
Lecturer(s)	Assoc. Prof. A	Ainur Abdir	na					
	Assoc. Prof.	Assoc. Prof. Gulmira Sheriyazdanova						
	Assoc. Prof.	Mariyash B	ozzigite	ova				
Language	English							
Relation to curriculum	Compulsory	sory course for all specialties.						
Type of	Lectures serv	ectures serve to introduce new concepts and provide theoretical and methodological						
teaching	foundations.	foundations.						
	Practice ses	sions (semi	inars) a	are acti	ve se	ssions t	to develop	student's confidence
	through new	examples a	nd discu	issions	on the	problem	ms.	
	Instructor-su	ipervised i	ndepen	dent st	udy (I	ÍSIS) de	eals with re	eview and exploration
	in greater dep	oth of the co	ourse ma	aterial.	• 、			*
	Student's in	dependent	study (SIS): S	Self-st	udy tim	e including	g the time required to
	prepare for an	nd complete	all cou	rse asse	essmei	nts.		-
Workload of								
course	ECTS	Cont	act hour	rs	ISIS	SIS	Total hou	rs
components	credits	Lectures	Practi	ce				
and credits per			sessio	ns				
trimester	5	30	2	0	10	90	150	
		•	•			•		
Course								
assessment and	Period	Assessme	nt	Numb	ber	Exam	Form	Schedule
forms of		type		of poi	nts			(Week #)
examination	1 st	Individua	1	30		Submi	ssion of	3 rd week
	attestation	assignmen	nt			glossary		
		Group project		30		Presentation		4 th week

		Mid-term Exam	40	Ouiz	5 th week			
		1 st attestation	100					
		total	100					
	2nd	Individual	30	Submission of	8 th week			
	attestation	assignment	50	glossary	0 WCCK			
		Group project	30	Video	9 th week			
		End-term Exam	40	Quiz	10 th week			
		and the tri	100					
		2 nd attestation	100					
	Final Exam		100	Quiz	During final exam session			
	Cumulative	Cumulative total for the course = $0.3 * 1^{st}$ Att + $0.3 * 2^{nd}$ Att + $0.4*$ Final = 100.						
Requirements	Course and	university polic	ies include:					
according to the	Attendance	Attendance is mandatory. Missing 30% of lessons will result in F (Fail)						
examination	grade (or su	grade (or summer school).						
regulations	Late submissions are not accepted.							
	No cheating, duplication, falsification of data, plagiarism, and crib							
	Contacting the Lecturer : students are welcome to arrange one-to-one meetings with the teacher during office hours to discuss the class.							
Recommended prerequisites	History, Logic, Ethics, Social science, Self-knowledge							
Module objectives/inte nded learning outcomes	By the end of this course students will attain the following learning outcomes. The student will show a working knowledge in:							
	1) Formation of students' philosophical reflection,							
	3) Formation of intellectual and creative potential of students							
	4) Increase basic philosophical analysis skills							
	5) Develop argumentative skills on conflicting topics;							
	o) Formation of critical thinking and functional literacy skills.							
	Students will have the skill to							
	- ability of the	ink critically and en	near meones	em-solving skills				
	- ability of ca	rrving out individu	al works on r	esearching draftin	g writing and editing:			
	- ability to se	lect and use referer	ce materials	:	b, which g and balance,			
	- ability of dis	scussing and interp	reting differe	ent philosophical id	leas			
	In terms of C	Competences, stud	lents will be	able to				
	- have a basi	c comprehension of	on characteri	stics of periods of	Eastern and Western			
	Philosophy;							
	- understand	the meaning of phi	ilosophical te	erms and categories	5			
	- express and	reasonably argue c	lifferent opin	ions on significant	philosophical topics.			
Content	This course	is an introduction	to the basi	c theories and co	ncepts in Philosophy			
	including kno	owledge of history	ot Philosop	bhy and the theory	of Philosophy, basic			
	philosophical	doctrines, terms an	nd categories	, and Philosophy o	I Science.			

Media	Multimedia classrooms equipped with computer, projection and audio system;
employed	Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	Basic Literature:
	1. W. Russ Payne, An Introduction to Philosophy, Bellevue College Press 2015.
	2. Johnston D. A. Brief History of Philosophy: from Socrates to Derrida,
	Bloomsbury Academic, 2011.
	3. Russell B. History of Western Philosophy, Touchstone Edition, 1986.
	4. Kenny A. A Brief History of Western Philosophy. Oxford University Press,
	USA, 2010.
	5. Masalimova A. R., Altaev Zh.A., Kasabek A. K. Kazakh philosophy.
	Textbook Almaty, 2018.
	Supplementary literature:
	1. "Love, Order, and Progress : The Science, Philosophy, and Politics of Auguste
	Comte", 2018
	2. Augustinus, Confessiones, trans. By Henry Chadwick (Oxford World's Classical)
	Classics)
	5. Gilles Deleuze & Felix Guallari: what is Philosophy?
	4. Infinance Kant. What is enlightenment?
	6. Martin Heidegger. The Question Concerning Technology. Corland Publishing
	New York 1077 Joan T Wilde (New Heyen Conn : Collage University Press, 1056)
	Abai Kunanhayay (Book of Words)
	8 Sh Kudaiberdiulu 'Ush Anyk'
	9 Michel Bourdeau Mary Pickering arren Schmaus "Love Order and Progress:
	The Science Philosophy and Politics of Auguste Comte" 2018
	10. Mariusz Tabaczek Emergence: Towards A New Metaphysics and Philosophy
	of Science, 2019 Mariusz Tabaczek
	11. Michele Merritt, Minding Dogs: Humans, Canine Companions, and a New
	Philosophy of Cognitive Science, 2021
L	

Module name:	Technological Entrepreneurship							
Trimester	7							
Person responsible for the	Assel Nurguz	hina;						
module	Aigerim Zuye	eva						
Language	English							
Relation to curriculum	Project manag	gement pos	sition for 3 ye	ars at th	e interr	national project		
	including a lo	ng-term bi	udget manage	ment an	d team	lead, course		
	completion at	Start up A	cademy of As	stana Hu	ıb			
Teaching methods	- Class discussions							
	- Individual additional literature assessment							
	- Presentations							
	- Research analysis presentation							
	- Gamified tasks during practice sessions							
Workload (incl. contact hours,	ECTS	Con	tact hours	ISIS	SIS	Total hours		
self-study hours)	credits	Lectures	Practice					
			sessions					
	5	20	30	10	90	150		
Credit points	5 credits				•			
Required and recommended	Project Mana	gement (ta	sk decomposi	tion, ass	ignmei	nt), Financial		
prerequisites for joining the	management	(cost-bene	fit analysis)		-			
module		•	• /					

Module objectives/intended	By the end of this course students will attain the following learning
learning outcomes	The student will show a working knowledge in:
	• science-based research and technological breakthroughs can be transformed into new business;
	• the frontier of current knowledge when it comes to creating value from technological inventions and managing early-stage commercialization processes;
	• technical expertise with business, finance and leadership skills to become a technology leader or entrepreneur.
	• recognizing technology trends, align business needs and technology strategy, make business cases that justify investments.
	Students will have the skill to
	• have the requisite competencies such as attitudinal, intellectual, behavioural and managerial to be able to create business value in today's economy;
	• have specific knowledge of the business, play social roles and remain skilful, creative, passionate, motivative, optimistic, persuasive, flexible, resourceful, assume risk, excellent planner and problem solver.
	 In terms of competences, students will be able to Understand all stages of technology entrepreneurship; Interpret the peculiarities of the global project development in accordance with national approaches; consistently pass all steps from the identification of entrepreneurial perspectives, the building of innovative processes in the organization, the development of an innovative organization, creating strategies for the technology business, evaluation of technological innovations, leadership development and constructive communication to planning finance and business models of technology entrepreneurship.
Content	identification of entrepreneurial perspectives, the building of innovative processes in the organization, the development of an innovative organization, creating strategies for the technology business, evaluation of technological innovations, leadership development and constructive communication to planning finance and business models of technology entrepreneurship.
Exams and assessment formats	Classroom discussions, presentations, final project demo
Study and examination requirements	Requirements for successfully passing the module e.g. the final grade in the module is composed of 60% performance on exams, 40% take-home assignments, bonuses of in-class participation. Students must have a final grade of 60% or higher to pass

Reading list	Assigned reading materials and presentations should be read prior to class. Class lectures and discussions will proceed with supplemental and advanced topics, which could be difficult to understand unless students have read the assigned material. Readings are listed in the schedule section. All necessary updates and / or changes to the course will be reflected in the Learning Management System (moodle.astanait.edu.kz).
	 Basic Literature: Eric Ries. The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses Crown Business, 2011, ISBN-13: 978-0307887894 2. Alexander Osterwalder & Yves Pigneur Business Model Generation/ An amazing crowd of 470 practitioners from 45 countries\Copyright © 2010 by Alexander Osterwalder. All rights reserved. Published by John Wiley & Sons, Inc., Hoboken, New Jersey. Published simultaneously in Canada. ISBN: 978-0470- 87641-1 Printed in the United States of America 2018 Supplementary literature: Ash Maurya. Running Lean: Iterate from Plan A to a Plan That Works (Lean (O'Reilly)) 2nd O'Reilly Media; 2nd edition (March 20, 2012) ISBN-13: 978-1449305178. Rob Fitzpatrick. The Mom Test: How to talk to customers & learn if your business is a good idea when everyone is lying to you. CreateSpace Independent Publishing Platform; 1st edition (September 10, 2013), ISBN-13: 978-1492180746. Ian Chaston (2017). Technology Entrepreneurship. Technology- driven vs market-driven entrepreneurship; Tony Bailetti (2012). Technology Entrepreneurship: Overview, Definition and distinctive aspects; Ian Chaston (2017). Technology Entrepreneurship. Technology Entrepreneurship: Richard Florida and Martin Kenney (1988) Venture capital and high technology entrepreneurship. Journal of Business Venturing; Ross Brown and Collin Mason (2014) Inside the high-tech black box: A critique of technology entrepreneurship policy;

Module name:	Academic Writing							
Code								
Trimester	7							
Person	Fariza Tolesh							
responsible	Aigerim Uraz	bekova						
for the module	Aliya Ayazba	yeva						
	Elmira Gerfar	iova						
Lecturer(s)	Fariza Tolesh							
	Aigerim Uraz	bekova						
	Aliya Ayazba	iya Ayazbayeva						
	Elmira Gerfar	nova						
Language	English							
Relation to	compulsory							
curriculum								
Type of teaching	Lectures serv	e to introdu	ice new concep	ts and p	rovide	theoretical an	d methodol	ogical
	foundations.		、 · ·				1	
	Practice sess	ions (semi	nars) are activ	ve sessi	ons to	develop stud	lent's confi	dence
	through new e	examples a	nd discussions	on the j	oroblei	ns.	1 1	<i>.</i> .
	Instructor-su	pervised I	ndependent st	udy (18	5 1 5) de	als with review	w and explo	ration
	In greater dep	ln of the co	ourse material.	alf stur	he time	including the	timo roqui	rad to
	prepare for an	d complete	study (SIS): S	en-stut	iy time	menualing the	e unite requi	led to
Workload of		u compicu		255111011	.5.			
course	FCTS	Cont	act hours	1515	212	Total hours	7	
components and	credits	Lecture	Practice	1515	515	10tal liouis		
credits per		s	sessions					
trimester	5	20	30	10	90	150		
		20	50	10	70	150		
Course								
assessment and	Period		Assign	ments			Weight	
forms of							(%)	
examination	Midterm	Assig	nments:				30	
	assessment	Syllab	ous quiz				2	
		Quota	tions task				4	
		Parap	hrasing task		• •		4	
		Resea	rch problem an	d quest	10n/s		10	
		Midte	erm presentati	on RP	& RQ		10	
	En 1 to ma	A*					20	
	End term	Assig	nments:		~ / 41 • • • •		30 5	
	Assessment	Descr	relevant of relevant of relevant of relevant of the relevant o	incept	s/theor	les	5	
		Resea	rch significanc	AIZ P			5	
		Resea	rch overview	C			5	
		End-	term presenta	tion co	ncents	L.	10	
	methodology and research							
	significance with the overview							
	Final exam*	Final	TEST				40	
	Total	03*	1 st Att + 0 3 * '	nd Att	+ 0 4*	Final	υ	
	Iotai	0,5	I III + 0,5 I		· 0,-	l'inai		
Requirements	Course and	universit	v nolicies inc	-ahu				
according to the	Attendance	is manda	y punctes me tory Missing	30%	of loss	ons will res	ult in F <i>(</i> F	ail)
examination	arada (ar su	mmor col	101 y. 191155111g 1001)	5070	01 1033		unt III I' (I')	a11 <i>)</i>
regulations	I ate submiss	ions are r	ot accented					
		dure l'ere n	ion folger 4	ion - f	det-	nla <i>g</i> :	and and	
1	I INO CREATING	, auplicat	ion, faisificat	10 noi	uata,	plagiarism,	and crib	

	Contacting the Lecturer : students are welcome to arrange one-to-one
	meetings with the teacher during office hours to discuss the class.
Recommended	C1 level English
prerequisites	
Module	By the end of this course students will attain the following learning outcomes.
objectives/inten	The student will show a working knowledge in:
ded learning	
outcomes	• identifying the relevant sources for the diploma thesis research
	• describing the context of the research based on the sources
	• defining the main concepts of the diploma thesis research
	• critically evaluating various contexts
	Students will have the skills to:
	effectively summarize and analyse academic texts while identifying and
	highlight their main ideas and messages
	develop independent perspectives and arguments via successful
	incorporation of research sources
	neorporation of research sources effectively and accurately
	explain the diploma thesis problem and significance
	• explain the upforma mesis problem and significance
	• Iormulate the research question of the thesis
	• compare the ideas from the sources
	• determine the research gap in the chosen field
	• examine databases to find appropriate academic sources
	• develop abilities as critical thinkers, readers and writers
	• develop an understanding of the demands of academic research at AITU
	• strengthen the ability to write texts using academic language using the
	process approach
	integrate different academic sources
	• summarize information from academic sources, distinguishing between main
	ideas and details
	In terms of Competences, students will be able to
	• developing their own voice and creating a balance between their own voice
	and source summaries
	• apply the conventions of APA referencing style /th edition and be aware of how to avoid plagiarism
	• discover scientific databases to locate appropriate academic sources, evaluate
	those sources and integrate them thoughtfully, responsibly, and ethically in their own thesis writing
	• connect the ideas from academic sources to build the background of the
	diploma research
	• assess peers' papers following the assessment criteria rubric
	• evaluate the relevant theories and methods
	• convince the reader of the significance of the diploma research
	• justify the choice of theories and methods of the diploma research
Content	Academic Writing is designed to help students focus on skills in academic writing for
	thesis research, reading and speaking with an emphasis on the rules of academic
	English style, research and academic vocabulary and academic language use. This
	syllabus is developed in accordance with the Education program of the BA degree in
	Computer Science, Telecommunication Systems, Cybersecurity. IT Management.
	Digital Journalism, Media Technology, Big Data. Software Engineering and
	Industrial Automation. At the end of the course students will be able to successfully
	apply their knowledge and skills in academic English, demonstrate their academic

	English language competence and most the Astens IT University coursework								
	anguage competence, and meet the Astalia II Olliveisity coursework								
	ssignments.								
Media	Multimedia classrooms equipped with computer, projection and audio system;								
employed	Whiteboard; Microsoft Teams; LMS Moodle.								
Reading list	Basic Literature:								
_	• Методические указания к выполнению дипломных работ в ТОО								
	"ASTANA IT UNIVERSITY" https://moodle.astanait.edu.kz								
	• Paterson, K., & Wedge, R. (2018). Oxford Grammar for EAP: English								
	grammar and practice for Academic Purposes. Oxford university press.								
	Supplementary literature:								
	• Lazar, J., Feng, J. H., & Hochheiser, H. (2017). Research methods in huma								
computer interaction. Morgan Kaufmann.									
	• Pickard, A. J. (2013). Research methods in information. Facet publish								
	• Taylor & Francis Journals Standard Reference Style Guide: America								
	Psychological Association, Seventh Edition (APA-7)								
	• Bottomley, J. (2021). Academic writing for international students of science.								
	Routledge.								

Module name:	High Performance Computing							
Code								
Trimester	7							
Person responsible for the module	Shchukin Geo	orgy						
Lecturer(s)	Shchukin Geo	orgy						
Language	English							
Relation to	Educational I	Program: Bi	ig Data	Analysi	S			
curriculum	Elective cour	se						
Type of teaching	Lectures serv	erve to introduce new concepts and provide theoretical and methodological				l and methodological		
	foundations.	toundations.						
	through now	sions (semi	nars) a	are acus	/e ses	sions w	aevelop s	student s confidence
	Infough new	examples al	nd discu	ISSIONS (on me dv (I		ns. ala with ray	view and exploration
	in greater der	apervised in	nuepen	atorial	uuy (1	51 5 <i>)</i> ue		view and exploration
	Student's in	denendent	etudy (SIS) · S	elf-str	udv time	e including	the time required to
	prepare for a	nd complete	all cou	urse asse	vssmet	nts	menuanis	the time required to
Workload of		lu comprete	un eca	100 0000	/0011101	10.		
course	ECTS	Cont	act hour	rs	ISIS	SIS	Total hou	irs
components and	credits	Lecture	Practi	ce		~		
credits per		s	sessio	ns				
trimester	5	30	2	0	50	50	150	
			1	<u> </u>				
Course								
assessment and	Period	Assessme	nt	Numb	ber	Exam	Form	Schedule
forms of		type		of poi	nts			(Week #)
examination	1 st	laboratory	aboratory work 60			Submission of		Weekly
	attestation	1-4				writter	n reports	
							_	
	11	Mid-term	Exam	40		Writte	n	5 th week
		1 st attesta total	ition	100				

	2nd	laboratory work	60	Submission of	Weekly			
	attestation	5-8		written reports				
		End-term Exam	40	Written	10 th week			
		2 nd attestation total	100					
	Final exem	totui	100		During final			
					exam session			
	Cumulative	total for the course	e = 0,3 *	1 st Att + 0,3 * 2 nd Att -	+0,4*Final=100.			
Requirements according to the	Course and Attendance	university polic	ies inclu Aissing 3	de: 0% of lessons will 1	result in F (Fail)			
examination	grade (or su	immer school).	8-					
regulations	Late submis	sions are not acce	epted.					
	No cheating	g, duplication, fa	İsificatio	n of data, plagiaris	m, and crib			
	Contacting	the Lecturer: stu	idents are	e welcome to arrang	e one-to-one			
	meetings wi	th the teacher dur	ring offic	e hours to discuss th	e class.			
Recommended prerequisites	Introduction	to Programming,						
Module								
objectives/inten	By the end of	f this course studen	ts will att	ain the following learn	ing outcomes.			
ded learning	I he student	will snow a worki	ng knowl	edge in:	and their			
outcomes	applications i	n big data analytic	er tormai	ice computing (III C)				
	parallel and c	listributed program	ming tech	niques used in HPC.				
	role of HPC i	n big data analytic	s and its a	pplications in industry	<i>.</i>			
		0						
	Students wil	l have the skills to	:					
	Gain hands-o	n experience work	ing with H	IPC frameworks and l	ibraries.			
	Understand t	he performance me	trics and l	benchmarks used to ev	valuate HPC systems.			
	Analyze and	optimize HPC app	lications t	o achieve better perior	mance.			
	In terms of (Competences, stud	lents will	be able to:				
	Develop skill	s in using HPC for	solving r	eal-world big data ana	lytics problems.			
	I	bevelop skins in using the for solving real-world ong data anarytics problems.						
Content	Parallel and d	Parallel and distributed programming techniques						
	Introduction	o parallel and distri	buted con	nputing models				
	Understandin	g the challenges of	parallel aı	nd distributed program	ming			
	Developing s	kills in parallel and	distribute	d programming technic	ques			
	HPC framew	orks and libraries						
	Overview of	IDC from overally o	ad libraria	a including MDI One	nMD and CUDA			
	Hands-on eve	erience with HPC	nu norarie	s, menualing MP1, Ope and libraries	invir, and CUDA			
	Developing H	IPC applications us	ing frame	works and libraries				
	Performance	evaluation and opti	mization					
Media	Multimedia c	lassrooms equippe	d with con	nputer, projection and	l audio system;			
employed	Whiteboard;	Microsoft Teams;	LMS Moo	odle.				
Reading list	1. Davi	d E. Culler, Jaswin	der Pal Si	ngh, and Anoop Gupta	n, "Parallel Computer			
	Architecture:	A Hardware/Softw	are Appro	bach", Morgan Kaufma	ann Publishers, 1999.			
	2. Peter	Pacneco, "Paralle	el Progra	mming with MPI",	isi Edition, Morgan			
	3 Rarh	aunsheis, 1997. ara Chanman Gab	riele Iost	and Ruud van der P	as "Using OpenMP			
	Portable Shar	red Memory Paralle	el Progran	ming", 2nd Edition, 7	The MIT Press, 2017.			

4. John Cheng, Max Grossman, and Ty McKercher, "Professional CUDA C
Programming", 1st Edition, John Wiley & Sons, 2014.
5. Robert Grossman, "Big Data and High Performance Computing
Frameworks and Applications", Chapman and Hall/CRC, 2017.

Module designation	Business Intelligence							
Semester(s) in which the	7 th trimester							
module is taught	Nuddoot The dildin							
Person responsible for the	Nurkhat Ibadildin							
	Assel Nurguznina English							
Relation to curriculum	Workflow and Groupware Systems:							
	IT operation Management							
	BDA - Elective							
Teaching methods	- Class discussions							
	- Individual additional literature assessment							
	- Presentations							
	entation							
	- Gamified tasks during practice sessions							
	- team presentations; written exams; attendance							
Workload (incl. contact hours,	Vorkload (incl. contact hours, Elf-study hours) ECTS credits		Cont	act hours	ISIS	SIS	Total hours	
self-study hours)			Lectures	Practice				
				sessions				
	5	5		30	10	90	150	
Credit points								
Required and recommended	Period	A	ssignments	Number of		Total		
prerequisites for joining the			<u>(; 1 m</u>		points		100	
module	lst	1st Mid Term			30		100	
	attestau	te	am presen					
	on written exams;							
		-	tondunee					
	2.1	E	1		20 100			
	2na attestati	El	na lenn	tations	30		100	
	on	w	ritten exan					
		at	tendance					
	Final	Final 40			40 100		100	
	exam*							
	Total	0,	,3 * 1st Att	+0,3 * 2nd	100		100	
	Att + 0,4*Final							

Module objectives/intended	By the end of this course students will attain the following
learning outcomes	learning outcomes.
	The student will show a working knowledge in:
	• theoretical concepts of the course materials (e.g., textbook,
	journal articles, etc.) to the decision-making and BI processes and
	technologies for making appropriate managerial decisions in future
	real-life situations.
	Students will have the skill to
	• understand how "text book theory" works "in today's
	business practices". Ultimately, it will be up to student to relate the
	theory and associated readings to the practical business
	applications.
	In terms of Competences, students will be able to
	• Undertake systematic investigation/research related to the
	decision support and BI systems and technologies for today's
	dynamic business environment.
	• Develop professional attitudes in students in relation to the
	team work interpersonal communication, and business ethics
	team work, interpersonal communication, and susmess entres.
Content	This course will examine Business Intelligence (BI) technologies
Content	that help a company to improve its business. It discusses BI topics
	from managerial perspectives. Managerial perspectives discuss
	how BL affects the organization's decision making process
	This course will cover data science, data visualization dashboard
	design norformanae deshboard and future of PL Exponential
	design, bertormance dashboard and future of bl. Exponential
	in an and availability of data makes Dusinger
	increase in size and availability of data makes Business
Madia ang lang d	increase in size and availability of data makes Business Intelligence (BI) a valuable course.
Media employed	increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system: Whiteheard: Microsoft Teams: LMS Moodle
Media employed	increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle.
Media employed	increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle.
Media employed Reading list	increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook:
Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda R Delen D Efraim T (2018) Business
Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda, R., Delen, D., Efraim, T. (2018). Business intelligence analytics and data science: a managerial perspective
Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda, R., Delen, D., Efraim, T. (2018). Business intelligence, analytics, and data science: a managerial perspective (4th ed.) Pearson Education. Inc.
Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda, R., Delen, D., Efraim, T. (2018). Business intelligence, analytics, and data science: a managerial perspective (4th ed.). Pearson Education, Inc. Sharman P. (2015). Business Intelligence Guidabook:
Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda, R., Delen, D., Efraim, T. (2018). Business intelligence, analytics, and data science: a managerial perspective (4th ed.). Pearson Education, Inc. Sherman, R. (2015). Business Intelligence Guidebook: Errom Data Integration to Analytics, Elsaviar Inc.
Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda, R., Delen, D., Efraim, T. (2018). Business intelligence, analytics, and data science: a managerial perspective (4th ed.). Pearson Education, Inc. Sherman, R. (2015). Business Intelligence Guidebook: From Data Integration to Analytics. Elsevier Inc. Hurlay, P. (2020). Business Intelligence: An Eccential
Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda, R., Delen, D., Efraim, T. (2018). Business intelligence, analytics, and data science: a managerial perspective (4th ed.). Pearson Education, Inc. Sherman, R. (2015). Business Intelligence Guidebook: From Data Integration to Analytics. Elsevier Inc. Hurley, R. (2020). Business Intelligence: An Essential Basinger's Cuide to BL Big Data. Artificial Intelligence
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Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda, R., Delen, D., Efraim, T. (2018). Business intelligence, analytics, and data science: a managerial perspective (4th ed.). Pearson Education, Inc. Sherman, R. (2015). Business Intelligence Guidebook: From Data Integration to Analytics. Elsevier Inc. Hurley, R. (2020). Business Intelligence: An Essential Beginner's Guide to BI, Big Data, Artificial Intelligence, Cybersecurity, Machine Learning, Data Science, Data Analytics, Social Madia and Integration Analytics.
Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda, R., Delen, D., Efraim, T. (2018). Business intelligence, analytics, and data science: a managerial perspective (4th ed.). Pearson Education, Inc. Sherman, R. (2015). Business Intelligence Guidebook: From Data Integration to Analytics. Elsevier Inc. Hurley, R. (2020). Business Intelligence: An Essential Beginner's Guide to BI, Big Data, Artificial Intelligence, Cybersecurity, Machine Learning, Data Science, Data Analytics, Social Media and Internet Marketing. Ationa Publications.
Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda, R., Delen, D., Efraim, T. (2018). Business intelligence, analytics, and data science: a managerial perspective (4th ed.). Pearson Education, Inc. Sherman, R. (2015). Business Intelligence Guidebook: From Data Integration to Analytics. Elsevier Inc. Hurley, R. (2020). Business Intelligence: An Essential Beginner's Guide to BI, Big Data, Artificial Intelligence, Cybersecurity, Machine Learning, Data Science, Data Analytics, Social Media and Internet Marketing. Ationa Publications. Howson, C. (2014) Successful Business Intelligence,
Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda, R., Delen, D., Efraim, T. (2018). Business intelligence, analytics, and data science: a managerial perspective (4th ed.). Pearson Education, Inc. Sherman, R. (2015). Business Intelligence Guidebook: From Data Integration to Analytics. Elsevier Inc. Hurley, R. (2020). Business Intelligence: An Essential Beginner's Guide to BI, Big Data, Artificial Intelligence, Cybersecurity, Machine Learning, Data Science, Data Analytics, Social Media and Internet Marketing. Ationa Publications. Howson, C. (2014) Successful Business Intelligence, Second Edition: Unlock the Value of BI & Big Data. McGraw- UNDED
Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda, R., Delen, D., Efraim, T. (2018). Business intelligence, analytics, and data science: a managerial perspective (4th ed.). Pearson Education, Inc. Sherman, R. (2015). Business Intelligence Guidebook: From Data Integration to Analytics. Elsevier Inc. Hurley, R. (2020). Business Intelligence: An Essential Beginner's Guide to BI, Big Data, Artificial Intelligence, Cybersecurity, Machine Learning, Data Science, Data Analytics, Social Media and Internet Marketing. Ationa Publications. Howson, C. (2014) Successful Business Intelligence, Second Edition: Unlock the Value of BI & Big Data. McGraw- Hill Education.
Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda, R., Delen, D., Efraim, T. (2018). Business intelligence, analytics, and data science: a managerial perspective (4th ed.). Pearson Education, Inc. Sherman, R. (2015). Business Intelligence Guidebook: From Data Integration to Analytics. Elsevier Inc. Hurley, R. (2020). Business Intelligence: An Essential Beginner's Guide to BI, Big Data, Artificial Intelligence, Cybersecurity, Machine Learning, Data Science, Data Analytics, Social Media and Internet Marketing. Ationa Publications. Howson, C. (2014) Successful Business Intelligence, Second Edition: Unlock the Value of BI & Big Data. McGraw- Hill Education.
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Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda, R., Delen, D., Efraim, T. (2018). Business intelligence, analytics, and data science: a managerial perspective (4th ed.). Pearson Education, Inc. Sherman, R. (2015). Business Intelligence Guidebook: From Data Integration to Analytics. Elsevier Inc. Hurley, R. (2020). Business Intelligence: An Essential Beginner's Guide to BI, Big Data, Artificial Intelligence, Cybersecurity, Machine Learning, Data Science, Data Analytics, Social Media and Internet Marketing. Ationa Publications. Howson, C. (2014) Successful Business Intelligence, Second Edition: Unlock the Value of BI & Big Data. McGraw- Hill Education. Kaldero N. (2018). Data Science for Executives: Leveraging Machine Intelligence to Drive Business ROI. Lioncrest Publishing. Covington, D. (2016). Analytics: Data Science, Data Analysis and Predictive Analytics for Business (5th ed.).
Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda, R., Delen, D., Efraim, T. (2018). Business intelligence, analytics, and data science: a managerial perspective (4th ed.). Pearson Education, Inc. Sherman, R. (2015). Business Intelligence Guidebook: From Data Integration to Analytics. Elsevier Inc. Hurley, R. (2020). Business Intelligence: An Essential Beginner's Guide to BI, Big Data, Artificial Intelligence, Cybersecurity, Machine Learning, Data Science, Data Analytics, Social Media and Internet Marketing. Ationa Publications. Howson, C. (2014) Successful Business Intelligence, Second Edition: Unlock the Value of BI & Big Data. McGraw- Hill Education. Kaldero N. (2018). Data Science for Executives: Leveraging Machine Intelligence to Drive Business ROI. Lioncrest Publishing. Covington, D. (2016). Analytics: Data Science, Data Analysis and Predictive Analytics for Business (5th ed.). Marko, R., & Alberto, F. (2020) Definitive Guide to
Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda, R., Delen, D., Efraim, T. (2018). Business intelligence, analytics, and data science: a managerial perspective (4th ed.). Pearson Education, Inc. Sherman, R. (2015). Business Intelligence Guidebook: From Data Integration to Analytics. Elsevier Inc. Hurley, R. (2020). Business Intelligence: An Essential Beginner's Guide to BI, Big Data, Artificial Intelligence, Cybersecurity, Machine Learning, Data Science, Data Analytics, Social Media and Internet Marketing. Ationa Publications. Howson, C. (2014) Successful Business Intelligence, Second Edition: Unlock the Value of BI & Big Data. McGraw- Hill Education. Kaldero N. (2018). Data Science for Executives: Leveraging Machine Intelligence to Drive Business ROI. Lioncrest Publishing. Covington, D. (2016). Analytics: Data Science, Data Analysis and Predictive Analytics for Business (5th ed.). Marko, R., & Alberto, F. (2020) Definitive Guide to DAX, The: Business intelligence for Microsoft Power BI, SQL
Media employed Reading list	 increase in size and availability of data makes Business Intelligence (BI) a valuable course. Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle. Main literature: Textbook: Sharda, R., Delen, D., Efraim, T. (2018). Business intelligence, analytics, and data science: a managerial perspective (4th ed.). Pearson Education, Inc. Sherman, R. (2015). Business Intelligence Guidebook: From Data Integration to Analytics. Elsevier Inc. Hurley, R. (2020). Business Intelligence: An Essential Beginner's Guide to BI, Big Data, Artificial Intelligence, Cybersecurity, Machine Learning, Data Science, Data Analytics, Social Media and Internet Marketing. Ationa Publications. Howson, C. (2014) Successful Business Intelligence, Second Edition: Unlock the Value of BI & Big Data. McGraw- Hill Education. Kaldero N. (2018). Data Science for Executives: Leveraging Machine Intelligence to Drive Business ROI. Lioncrest Publishing. Covington, D. (2016). Analytics: Data Science, Data Analysis and Predictive Analytics for Business (5th ed.). Marko, R., & Alberto, F. (2020) Definitive Guide to DAX, The: Business intelligence for Microsoft Power BI, SQL Server Analysis Services, and Excel (Business Skills) (2nd ed.).

Module name:	Big Data and Distributed Algorithms									
Code										
Trimester	7									
Person	Yermek Alimzhanov, M.Sc.									
responsible										
for the module										
Lecturer(s)	Yermek Alimzhanov, M.Sc.									
Language	English									
Relation to	Bachelor programmes: Big Data Analysis									
curriculum										
	Compulsory course.									
Type of teaching	Lectures serve to introduce new concepts and provide theoretical and methodological									
	foundations.									
	Practice sessions (seminars) are active sessions to develop student's confidence									
	through new examples and discussions on the problems.									
	Instructor-supervised independent study (ISIS) deals with review and exploration									
	in greater depth of the course material. Student's independent study (SIS): Salf study time including the time required to									
	prepare for and complete all course assessments									
Workload of		ild complex		50 abbe	255111011					
course	ECTS	Contact hours ISIS SIS Total hours								
components and	credits	Lecture		515	10tul liouis					
credits per		s	ŝ							
trimester	5	20 30			10	90	150			
Course								. <u> </u>		
assessment and	Period	Assessme	ent type	Number		Exam Form		Schedule		
forms of				of points				(Week #)		
examination	1 st attestation	Self-Study in AWS Academy		30		Knowledge		Weekly		
						Check Quizzes				
		Lab Assignments		40		Written or Lab		$2^{nd}, 3^{rd}, 4^{th}$		
						reports		weeks		
		Mid-term Exam		30		Computer test		5 th week		
		1 st attestation		100						
	2.1	total		20		17	1 1	XX7 11		
	2nd Self-Study in		30		Knowledge		Weekly			
	attestation	AWS Aca	AWS Academy		40		K Quizzes	cth oth oth		
		Lab Assignments		40		written or Lab		0 , 8 , 9		
		End-term Exam		30		Computer test		10 th week		
				30		Computer test		10 week		
		2 nd attestation total		100						
	Final Exam			100	100		puter test	During final		
								exam session		
	Cumulative total for the course = $0.3 * 1^{st} Att + 0.3 * 2^{nd} Att + 0.4*Final = 100$.									
Requirements according to the examination regulations	Course and university policies include: Attendance is mandatory. Missing 30% of lessons will result in F (Fail) grade (or summer school). Late submissions are not accepted. No cheating, duplication, falsification of data, plagiarism, and crib Contacting the Lecturer: students are welcome to arrange one-to-one meetings with the teacher during office hours to discuss the class.									
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Recommended prerequisites	Information and Communication Technologies, Database Management Systems, Computer Organisation and Architecture, Machine Learning, Algorithms and Data Structures, and Operating Systems and Computer Networks.									
Module objectives/inten ded learning outcomes	 By the end of this course students will attain the following learning outcomes. The student will show a working knowledge in: data science in a data-driven organization. data pipeline Hadoop Spark Students will have the skills to: Use of Big Data oriented systems Hadoop & Spark Summarize the role and value of data science in a data-driven organization. Recognize how the elements of data influence decisions about the infrastructure of a data pipeline. Illustrate a data pipeline by using cloud services to meet a generalized use case. In terms of Competences, students will be able to: Identify scaling considerations and best practices for building pipelines that handle large-scale datasets. Design and build a data collection process while considering constraints such as scalability, cost, fault tolerance, and latency. Implement the steps to process structured, semistructured, and unstructured data formats in a data pipeline. Explain the concept of MapReduce and how Apache Hadoop is used in big data analytics. Analyze data by using open-source tools that are appropriate to a given use case. 									
Content	This course introduces you to the core concepts of big data processing and analytics. The course helps learners develop skills with cloud services that are critical for conducting analysis of big data problems. This course is intended for students who seek expertise on the tasks, tools, and strategies that are used to collect, store, prepare, analyze, and visualize data for use in analytics and ML applications. This course is most aligned to a data engineer role but would also be appropriate for data analysts; data scientists; extract, transform, and load (ETL) developers; or ML practitioners who want to understand how the data that they use in their analyses and predictions is prepared for analysis. The course will also familiarize you with some distributed algorithms and their application areas. You will learn about important big data storage and processing frameworks like Anache Hadoon. Anache Snark, and other software prokages of Hadoon accounter									
Media	Apache Hadoop, Apache Spark, and other software packages of Hadoop ecosystem.									
employed	Whiteboard; LMS Moodle. Lab assignments in the AWS Academy Sandbox environments. AWS Academy Data Engineering courses.									
Reading list	Basic Literature:23."EMC Education Services, (2015) "Data Science and Big Data Analytics:Discovering, Analyzing, Visualizing and Presenting Data," Wiley; 1st edition. 432									

 pages. 24. Jules Damji, et al. (2020) "Learning Spark: Lightning-Fast Data Analytics," O'Reilly Media, 2nd edition. 397 pages. 25. Ajay D. Kshemkalyani, Mukesh Singhal. (2008) "Distributed Computing: Principles, Algorithms, and Systems." Cambridge University Press, 1st edition. 754
 pages. Supplementary literature: 26. Jeffrey Dean, Sanjay Ghemawat (2004) MapReduce: Simplified Data Processing on Large Clusters, Google. 27. Sakti Mishra, (2022) "Simplify Big Data Analytics with Amazon EMR: A beginner's guide," Packt Publishing, 430 pages. 28. Mohammed J. Zaki, Wagner Meira Jr. "Data mining and analysis: fundamental concepts and algorithms" / Cambridge University Press, 2014.

Module name:	Applied Machine Learning							
Code								
Trimester	7							
Person	Aidarov Kana	at, PhD,						
responsible								
for the module								
Lecturer(s)	Aidarov Kan	at, PhD,						
Language	English Russ	sian						
Relation to	Educational I	Educational Program: Big Data Analysis						
curriculum	Compulsory	course	5 Duiu	i mary si	.0			
Type of teaching	Lectures serv	ve to introdu	ice new	concep	ts and	provide	theoretical	and methodological
-) [-] [-	foundations.			F		F		
	Practice sess	sions (semi	nars) a	re activ	ve ses	sions to	develop s	tudent's confidence
	through new	examples a	nd discu	issions	on the	problei	ns.	
	Instructor-su	upervised i	ndepen	dent st	udy (I	ÍSIS) de	als with rev	view and exploration
	in greater dep	oth of the co	ourse ma	aterial.				-
	Student's in	dependent	study (SIS): S	elf-stı	ıdy time	e including	the time required to
	prepare for an	nd complete	e all cou	rse asse	essmer	nts.		
Workload of		1			1			
course	ECTS	Cont	act hour	rs	ISIS	SIS	Total hou	rs
components and	credits	Lecture	Practi	ce				
credits per		S	sessio	ns				
trimester	5	30	2	0	50	50	150	
Course		Γ.					_	
assessment and	Period	Assessme	nt	Numb	ber	Exam	Form	Schedule
torms of	a et	type		of poi	nts	~ 1 .		(Week #)
examination	I st	laboratory	work	60		Submi	ssion of	Weekly
	attestation	1-4				writter	n reports	
		Mid-term	Exam	40		Writte	n	5 th week
		1 st attesta	tion	100				
		total						
	2nd	laboratory	/ work	60		Submission of		Weekly
	attestation	5-8				writter	n reports	
		End-term	Exam	40		Writte	n	10 th week

		2 nd attestation	100					
	Einal avam	total	100		During fingl			
	rinai exem		100		exam session			
	Cumulative	total for the course	$= 0.3 * 1^{st}$	$Att + 0,3 * 2^{nd} Att +$	0,4*Final=100.			
	~ ~ ~							
Requirements	Course and university policies include:							
examination	Attendance	is mandatory. N	lissing 30%	o of lessons will r	esult in F (Fall)			
regulations	I ate submiss	sions are not acce	nted					
	No cheating, duplication, falsification of data, plagiarism, and crib Contacting the Lecturer: students are welcome to arrange one-to-one							
	meetings wit	h the teacher dur	ing office h	ours to discuss the	e class.			
			C					
Recommended	Introduction to	o Programming, St	tatistics & D	ata Science 1,2				
Module								
objectives/inten	By the end of	this course studen	ts will attain	the following learn	ing outcomes.			
ded learning	The student v	will show a worki	ng knowledg	ge in:				
outcomes	• basic	principles of mach	ine learning,	, including supervise	ed and unsupervised			
	Students will	have the skills to	n big data an	larytics.				
	Devel	op skills in using	machine lear	ming tools and libra	ries, such as Scikit-			
	learn, Tensor	Flow, and Keras.		0	,			
	• Gain	experience with	feature sele	ection, feature eng	gineering, and data			
	preprocessing	techniques used in	n machine lea	arning.				
	• Under	rstand the evaluation	on metrics us	ed to assess the perf	ormance of machine			
	In terms of C	Competences. stud	ents will be	able to:				
	Analy	ze data by using c	pen-source t	cools that are approp	priate to a given use			
	case.							
	• Develop skills in building and training different types of machine learning							
	machines, and	as intear regressi i neural networks.	on, decision	trees, random for	esis, support vector			
	Analy	ze and interpret ma	achine learni	ng models to derive	meaningful insights			
	and recommend	ndations.	machina la	aming for colving	real world hig data			
	analytics prob	olems.	, machine le	aming for solving	ical-world big data			
Content	Machine learn	ing tools and libra	ries					
	Introduction	to machine lear	ning tools	and libraries, inc	luding Scikit-learn,			
	TensorFlow, a	ind Keras		1 111 .				
	Hands-on expe	erience with machi	ne learning to	ools and libraries				
	Feature selecti	ion and engineering	$\frac{1}{2}$	ions and moraries				
	Performance e	evaluation and optime	- mization					
	Building and t	raining machine le	arning model	ls				
Media	Multimedia cl	assrooms equippe	d with comp	uter, projection and	audio system;			
employed	Whiteboard; N	viicrosoft Teams; I	LMS Moodle	2.				
Reading list	1. Aurél	ien Géron, "Hands	-On Machine	e Learning with Scik	tit-Learn, Keras, and			
6	TensorFlow",	2nd Edition, O'Re	illy Media, 2	2019.	,, .			
	2. Ian G	oodfellow, Yoshu	a Bengio, a	nd Aaron Courville	e, "Deep Learning",			
	MIT Press, 20)16.						

3.	Sebastian	Raschka	and	Vahid	Mirjalili,	"Python	Machine	Learning",	3rd
Edition	, Packt Puł	olishing, 2	019.						

8th term

Module name:	Psychology							
Code								
Trimester	8							
Person	Assoc. Prof.	A.Issakhano	ova, Phl	D				
responsible			,					
for the module								
Lecturer(s)	Issakhanova Belessova Nu	Assel Alima ursulu MA i	akhanov n Pedas	vna PhE 20gv an) in Pe d psvc	dagogy hology	and psychological and psycholo	ology
Language	English			<u> </u>	<u> </u>	85		
Relation to	Bachelor pro	Bachelor programmes: all educational programmes						
curriculum								
Type of teaching	Lectures serv	ve to introdu	ice new	concep	ts and j	provide	theoretical	and methodological
	Practice ses	sions (semi	nars) a	re activ	ve sess	sions to	develop s	student's confidence
	through new	examples a	nd discu	issions	on the	problei	ns.	
	Student's in	dependent	study (SIS): S	elf-stu	dy time	e including	the time required to
	prepare for a	nd complete	e all cou	irse asse	essmen	its.		
Workload of	T CTC		. 1		TOTO	ara	T 11	
course	ECTS	Cont	act hou	rs	ISIS	SIS	Total hou	irs
credits per	credits	Lecture	Practi	ce				
trimester	2	10	1	0	10	30	60	
			1					
Course								
assessment and	Period	Assessme	nt	Numb	ber	Exam	Form	Schedule
forms of		type		of poi	nts			(Week #)
examination	1 st	Problem S	Sets	60		Submission of		Weekly
	attestation					writter	n reports	
		Mid-term	Exam	40		Writte	n.	5 th week
						Individ	dual	
		1 st attacto	tion	100		projec	l	
		total	uiui	100				
	2nd	Problem S	Sets	60		Submi	ssion of	Weekly
	attestation					writter	n reports	2
		End-term	Fyam	40		Writte	n	10 th week
			LAum			Individ	lual	10 Week
						project	t	
		2 nd attest total	ation	100				
	Final Exam			100		Quiz		During final
				1				CAULI 50551011
	Cumulative	total for the	e course	e = 0,3	* 1 st A	tt + 0,3	* 2 nd Att +	• 0,4*Final = 100.
				·		·		

Requirements according to the examination regulations	Course and university policies include: Attendance is mandatory. Missing 30% of lessons will result in F (Fail) grade (or summer school). Late submissions are not accepted. No cheating, duplication, falsification of data, plagiarism, and crib Contacting the Lecturer: students are welcome to arrange one-to-one meetings with the teacher during office hours to discuss the class.
Recommended prerequisites	Self-knowledge; Cultural Studies.
Module objectives/inten ded learning outcomes	 By the end of this course students will attain the following learning outcomes. The student will show a working knowledge in: applying psychological principles to everyday life. drawing appropriate, logical, and objective conclusions about behavior and mental processes from empirical evidence. evaluating misconceptions or erroneous behavioral claims based on evidence from psychological science. describing ethical principles that guide psychologists in research and therapy. Students will have the skill to read and understanding a range of psychological text; use psychological skills in communication; understand personal characteristics and needs; develop emotional intelligence; find the features of communication and use them in the relationship. In terms of Competences, students will be able to apply self-regulation methods; select and use reference materials in psychology; work with psychological person's health and stress resistance.
Content	This course provides an introduction to psychology for majors in IT related majors. Topics given major consideration include maturation and development, motivation, emotion, personality, mental health, intelligence, aptitude, social influence, attitudes, beliefs, and vocational adjustments.
Media employed	Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	 Basic Literature: 1. Douglas A. Kleiber. Series: Social Psychology Research Progress. Hauppauge : Nova. 2020. 2. Educational Psychology. By: Zeryl Joy M. Fiscal. Oakville, ON : Society Publishing. 2019. 3. Pedro F. Bendassolli. Series: Advances in Cultural Psychology: Constructing Human Development. Charlotte, NC : Information Age Publishing. 2019. 4. Looij, August van. Series: Psychology of Emotions, Motivations and Actions. New York : Nova. 2019. 5. Industrial Organisational Psychologists Engaging with the New World of Work. SIOPSA; Theo H Veldsman; et al. [S.l.] : KR Publishing. 2021. 6. Campbell. Series: Psychology of Emotions, Motivations and Actions. New York : Nova Medicine and Health. 2021. 7. Social Psychology: Handbook of Basic Principles / Van Lange A.M. Paul, H.E. Tory, W. A. Kruglanski New York : The Guilford Press, 2021. 8. Psychology [Terct] / G.M. David, C. Nathan DeWall 13 ed New York : Macmillan International Higher Education, 2021

9. Susan W. Weinschenk. 100 Things Every Desinger Needs To Know About
People / W. W. Susan USA : Pearson, 2020
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17. Susan W. Weinschenk. 100 Things Every Desinger Needs To Know About
People / W. W. Susan USA : Pearson, 2020

Module name:	Project Management						
Code							
Trimester	8						
Person	Associate pro	fessor N. Il	oadildin, PhD				
responsible							
for the module							
Lecturer(s)	Associate professor N. Ibadildin, PhD						
Language	English	English					
Relation to	Bachelor prog	Bachelor programmes: IT Management, IT Entrepreneurship					
curriculum	Compulsory course.						
Type of teaching	Lectures serve to present new ideas and give theoretical and methodological						
	groundwork (case analys	sis, problem so	lving, r	eal cas	e applications)	
	Practice sess	sions (sem	inars) are int	eractive	e sessi	ons designed	to develop firm
	understanding	g of its acco	unting and fina	uncial po	erspect	ives. Based or	the use of active
	teaching met	hods like o	case studies, p	roblem	solvir	ng and busines	ss cases through
	interactive dis	scussions,	MCQ's and an	alytic p	oroblen	n-solving stude	ents are urged to
	properly prep	are and act	ively participat	e.		:	and increations
	Instructor-st	ipervised	dotoil (discuss	study (1919)	is to explore	and investigate
	Student's in	donondont	study (SIS).	solf st	udv ti	ne including	preparation and
	completion of	f all course	examinations	5011-51	uuy m	ine, menualing	preparation and
Workload of	completion of		examinations.				
course	ECTS	Cont	act hours	ISIS	SIS	Total hours]
components and	credits	Lecture	Practice	1			
credits per		s	sessions				
trimester	4	20	20	10	70	120	
		•		•			<u>.</u>

Course										
assessment and	Period	Assessment	Number	Exam Form	Schedule					
forms of		type	of points		(Week #)					
examination	1 st	Individual	30	Written	2 ^d week					
	attestation	written	50	Witten	2 WOOK					
		assignment 1								
		Test assignment	20	MCO	2ª week					
			20	MCQ	JWCCK					
		Z Teem mainet	50	Domont and	4th weels					
		ream project	50	Report and Procentation	4 WEEK					
			100	Fresentation						
		1 ^a allestation	100							
	2	Individual	20		7th and all					
	2nd	Individual	20		/ week					
	attestation	written								
		assignment 4	20		Oth 1-					
		l est assignment	20		8 th week					
)	20		Oth 1					
		I eam project	30		9 th week					
		assignment 6	20							
		Attendance	30							
		and attacted are	100							
		2 nd attestation	100							
	Einel Exem	total	100	Writton avon	Duning fingl					
			100	w much exam	During Iniai					
					exam session					
	Cumulativa	Computed in a total for the second $= 0.2 \times 1^{\text{st}} + 0.2 \times 2^{\text{nd}} + 0.4 \times 1^{\text{st}} + 1.100$								
		total for the course	$z = 0, 3 \cdot 1$	$\operatorname{Au} + 0, 5 \cdot 2 \operatorname{Au}$	$+$ 0,4 ' Γ inal $-$ 100.					
Paquiraments	Course and	university notio	iog ingludo	•						
according to the	Attendence	ia mandatawa N	les include <i>Aigain a</i> 200	· / of loggong will	nogult in E (Eail)					
examination	Attendance	e is manualory. N	issing 30%	o of lessons will	result in F (Fall)					
regulations	grade (or su	ummer school).								
regulations	Late submis	sions are not acce	epted.							
	No cheating	g, duplication, fa	lsification	of data, plagiari	sm, and crib					
	Contacting the Lecturer : students are welcome to arrange one-to-one meetings with the teacher during office hours to discuss the class.									
Recommended	Business Adr	ninistration								
prerequisites										
Module										
objectives/inten	By the end of	f this course studen	ts will attain	the following lear	ning outcomes.					
ded learning	The student	will show a worki	ng knowled	ge in:						
outcomes	• Mode	ern project manager	ment fundan	nentals;						
	• Princ	piples of project ma	nagement.							
	Timespres of project management.									
	Students wil	l have the skill to								
	• Anal	yze projects through	gh different	methodologies ba	used on the project's					
	results and m	ake decisions as a	project mana	iger.						
	• Understand project's documents from manager's point of view									
	Project management literacy:									
	Reading and producing project's documents:									
	• Plant	ing:	project 5 dot							
	 Team 	work.								
		sion making								
	- Deek	munication.								
	• 0000	mumeanon,								

	T 1 1'
	• Leadership;
	• Work ethics;
	• Problem solving;
	Organizational skills.
	In terms of Competences, students will be able to
	• Understand project management fundamentals through reading textbook and
	lecturing on course topics.
	Communicate effectively on project management.
	• Apply work breakdown structures (WBS) for the project.
	• Employ necessary network scheduling techniques.
	• Create a project management plan.
	• Implement a developed project management plan.
	• Advance in concepts that will assist the student in his/her development
	academically, ethically, analytically, and develop as a project manager.
Content	Project management course will concentrate on the lifecycle of the project from the
	project manager's position. Students will understand the company's decision-making
	processes from the inception of the project and acquire knowledge of how to start and
	control new and existing projects. Main topics will include project integration, project
	scope management, project time and cost management, quanty management, numan
	management Undergraduates will learn how a company will initiate plan execute
	management. Ondergraduates will reall now a company will initiate, plan, execute, monitor and close projects under certain restrictions including scope, timeline, budget
	and resources.
Media	Multimedia classrooms equipped with computer, projection and audio system;
employed	Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	Basic Literature:
Reading list	Basic Literature:1. A Systems Approach to Planning, Scheduling, and Controlling, 12th ed. Harold
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Reading list	 Basic Literature: A Systems Approach to Planning, Scheduling, and Controlling, 12th ed. Harold Kerzner, ISBN-10: 9781119165354, ISBN-13: 978-1119165354, 2017 Project Management Case Studies 5th Edition, Harold Kerzner, ISBN-10: 1119385970, ISBN-13: 978-1119385974, 2017 A Guide to the Project Management Body of Knowledge (PMBOK® Guide)–Sixth Edition, Project Management Institute, ISBN-10: 9781628251845, ISBN-13: 978-1628251845, 2017 Agile Practice Guide 1st Edition, Project Management Institute, Inc., ISBN: 978-162825-199-9, 2017 PMP Exam Prep, What You Really Need to Know to Pass the Exam Tenth Edition, Upgraded, Rita Mulcahy, ISBN-10: 1943704279, ISBN-13: 978-1943704279, 2022. PMI-ACP Exam Prep: A Course in a Book for Passing the PMI Agile Certified Practitioner (PMI-ACP) Exam (Updated Second Edition). Mike Griffith, ISBN-10: 1932735984, ISBN-13: 978-1932735987, 2018 Supplementary literature: Successful Project Management 7th Edition, Cengage Learning, ISBN-10: 1337095478, ISBN-13: 978-1337095471, 2017 Contemporary Project Management 4th Edition, Timothy Kloppenborg, Vittal S. Anantamula, Kathryn Wells, Cengage Learning, ISBN-10: 9781337406451, ISBN-13: 978-1337101356, ISBN-13: 978-1337101356, 2018
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Reading list	 Basic Literature: A Systems Approach to Planning, Scheduling, and Controlling, 12th ed. Harold Kerzner, ISBN-10: 9781119165354, ISBN-13: 978-1119165354, 2017 Project Management Case Studies 5th Edition, Harold Kerzner, ISBN-10: 1119385970, ISBN-13: 978-1119385974, 2017 A Guide to the Project Management Body of Knowledge (PMBOK® Guide)–Sixth Edition, Project Management Institute, ISBN-10: 9781628251845, ISBN-13: 978-1628251845, 2017 A gile Practice Guide 1st Edition, Project Management Institute, Inc., ISBN: 978-1628251845, 2017 PMP Exam Prep, What You Really Need to Know to Pass the Exam Tenth Edition, Upgraded, Rita Mulcahy, ISBN-10: 1943704279, ISBN-13: 978-1943704279, 2022. PMI-ACP Exam Prep: A Course in a Book for Passing the PMI Agile Certified Practitioner (PMI-ACP) Exam (Updated Second Edition). Mike Griffith, ISBN-10: 1932735984, ISBN-13: 978-1932735987, 2018 Supplementary literature: Successful Project Management 7th Edition, Cengage Learning, ISBN-10: 193137406451, ISBN-13: 978-1337406451, 2018 Information Technology Project Management 9th Edition, Kathy Schwalbe, Cengage Learning, ISBN-10: 97813371013562018, 2018

https://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=1426600&lan
g=ru&site=ehost-live

Module name:	Research M	ethods and	Tools						
Code									
Trimester	8								
Person	Maxat Kasse	n, PhD							
responsible	Professor of I	Digital Publ	lic Adm	inistrati	ion,				
for the module	Astana IT Ur	iversity							
	m.kassen@as	stanait.edu.l	<u>KZ</u>						
Lecturer	Maxat Kassen, PhD								
	Professor of I	Professor of Digital Public Administration,							
	Astana IT Ur	iversity							
	m.kassen@as	stanait.edu.k	<u>KZ</u>						
Language	English								
Relation to	Bachelor pro	grammes: N	AT, ITM	1					
curriculum	Compulsory	course.							
T	-								
Type of teaching	Lectures serv	ve to introdu	ice new	concep	ts and	provide	theoretical	and methodological	
	foundations.	•				·	1	4 1 42 C 1	
	Practice sess	sions (semi	nars) a	re activ	ve ses	sions to	develop s	student's confidence	
	Infough new	examples al	nd disci	lssions dont st	on the	problei	ns. als with rev	view and exploration	
	in greater der	th of the oc	nuepen	uent su	uuy (I	1515) de		view and exploration	
	Student's in	denendent	study (SISIO S	elf_cti	idy time	including	the time required to	
	prepare for a	nd complete	study (all cou	irse asse	essme	nts	menualing	the time required to	
Workload of		ia compiete		150 4550	2551110	11:5•			
course	ECTS	Cont	act hou	rs	ISIS	SIS	Total hou	Irs	
components and	credits	Lectures	Practi	ce			1 otur nou		
credits per			sessio	ns					
trimester	5	20	3	0	10	90	150		
		1							
Course									
assessment and	Period	Assessme	nt	Numb	ber	Exam	Form	Schedule	
forms of		type		of poi	nts			(Week #)	
examination	1 st	Weekly		30		Submission of		Weekly	
	attestation	assignmen	nts			writter	n reports		
		Group pro	oject	30		Writte	n	4 th week	
		assignmen	nt			assign	ment		
		Mid-term	Exam	40		Writte	n	5 th week	
		d et		100		assign	ment		
		1 st attesta	tion	100					
	2.1			20		<u> </u>	·	W/ 11	
	2nd	weekly		30		Submi	ssion of	weekly	
	allestation	assignmen	itts			writter	i reports		
		Group pro	oject	30		Writte	n	9 th week	
		assignmen	nt			assign	ment		
		End-term	Exam	40		Writte	n	10 th week	
		and the t		100		assign	ment		
		2 nd attests	ation	100					
1		total		1					

	Final Exam	100	Written	During final					
				exam session					
	Cumulative total for the course = $0.3 * 1^{st} Att + 0.3 * 2^{nd} Att + 0.4*Final = 100.$								
Requirements according to the examination regulations	Course and university polic Attendance is mandatory. M grade (or summer school). Late submissions are not acce No cheating, duplication, fa Contacting the Lecturer: stu meetings with the teacher dur	ies includ Iissing 30 epted. Isification idents are ing office	e: % of lessons with of data, plagia welcome to arra hours to discuss	ill result in F (Fail) rism, and crib ange one-to-one s the class.					
Recommended	-								
Module objectives/inten	By the end of this course studen The student will show a worki	ts will attai ng knowle	n the following le dge in:	earning outcomes.					
ded learning outcomes	 key aspects of qualitative and quantitative methods of analysts from both theoretical and practical perspectives and from a wide variety of comparative cross- institutional and cross-country contexts; 								
	 Key trends, challenges a for effective management and le skills of content, contex 	nd opportu adership in t. stakehold	nities in building i various areas; ler. comparative a	nd policy analysis					
	• skins of context, stakeholder, comparative and policy analysis through investigating actual projects in the area, analyzing interesting cases from different countries and comparing concrete research methods and tools, unique innovative strategies in advancing effective management of research and development processes at both national and local levels:								
	• potential of scientific m and propose effective implemen advance management and leader	ethods to so tation strate rship.	blve various socio egies to address th	economic challenges ne challenges and					
	Students will have the skill to								
	• Know major theories a analysis;	and metho	dologies of quali	itative and quantitative					
	• Understand the benevo advance research and developm	olent effec ent at nation	ts of manageme nal levels from di	nt strategies aimed to fferent contexts;					
	 Identify key drivers, ch research methodology for effect Master such useful methodology 	allenges and ive IT and index of inve	nd opportunities media technology estigation as stake	for the development of management; cholder, content, context					
	 analysis as well as survey research and statistic analysis; Identify and assess key benchmarks in measuring the progress of research and development agendas in promoting more competitive and efficient management and leadership in the area. 								
	In terms of Competences, stud	lents will b	e able:						
	 to understand structure a to understand and apply of analysis for effective manage 	and compor a wide rang ment and le	nents of scientific ge of qualitative a cadership;	research; nd quantitative methods					
	• to conduct individual an of analysis;	nd group re	esearch projects, u	using scientific methods					
	• to identify, locate, se assignments.	lect and a	read scientific r	eferences for research					
Content	The key goal of the course is to	provide st	udents with the k	nowledge that will help					

	them to understand and apply various qualitative and quantitative methods of research for effective management and leadership.
Media employed	Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle.
Reading list	Basic Literature:
reducing list	1 Sofaer S (1999) Qualitative methods: what are they and why use them? Health
	services research 34(5 Pt 2) 1101
	2. Gerring, J. (2017). Qualitative methods. Annual review of political science. 20.
	15-36.
	3. Seaman, C. B. (2008). Qualitative methods. In Guide to advanced empirical
	software engineering (pp. 35-62). Springer, London.
	4. Crang, M. (2003). Qualitative methods: touchy, feely, look-see?. Progress in
	human geography, 27(4), 494-504.
	5. Potter, W. J. (2013). An analysis of thinking and research about qualitative
	methods. Routledge.
	6. Taylor, G. R. (Ed.). (2005). Integrating quantitative and qualitative methods in
	research. University Press of America.
	7. Sechrest, L., & Sidani, S. (1995). Quantitative and qualitative methods:: Is There
	an Alternative?. Evaluation and program planning, 18(1), 77-87.
	8. Crang, M. (2002). Qualitative methods: the new orthodoxy?. Progress in human
	geography, 26(5), 647-655.
	9. Osborne, J. W. (Ed.). (2008). Best practices in quantitative methods. Sage.
	10. Cook, T. D., & Reichardt, C. S. (Eds.). (1979). Qualitative and quantitative
	methods in evaluation research (Vol. 1). Beverly Hills, CA: Sage publications.
	11. Steckler, A., McLeroy, K. R., Goodman, R. M., Bird, S. T., & McCormick, L.
	(1992). Toward integrating qualitative and quantitative methods: an introduction.
	Health education quarterly, 19(1), 1-8.
	12. Stockemer, D., Stockemer, G., & Glaeser. (2019). Quantitative methods for the
	social sciences (Vol. 50, p. 185). Quantitative methods for the social sciences:
	Springer International Publishing.
	13. Lewin, C. (2005). Elementary quantitative methods. Research methods in the
	social sciences, 215-225.
	14. Nardi, P. M. (2018). Doing survey research: A guide to quantitative methods.
	Koulledge.
	1 Adda L & Cooper P. W. (2003) Dynamic aconomics: quantitative methods
	and applications MIT press
	2 Khandker S R Koolwal G R & Samad H A (2000) Handbook on impact
	evaluation: quantitative methods and practices. World Bank Publications
	3 Waters D & Waters C D I (2008) Quantitative methods for husiness
	Pearson Education
	4. Grav. P. S., Williamson, J. B., Karp, D. A., & Dalphin, J. R. (2007). The research
	imagination: An introduction to qualitative and quantitative methods. Cambridge
	University Press.
	5. Spicer, N. (2004). Combining qualitative and quantitative methods. Researching
	society and culture, 2, 293-303.
	6. Kidder, L. H., & Fine, M. (1987). Qualitative and quantitative methods: When
	stories converge. New directions for program evaluation, 1987(35), 57-75.
	7. Curvin, J., & Slater, R. (2002). Quantitative methods for business decisions.
	Thomson Learning.
	8. Morgan, D. L. (2013). Integrating qualitative and quantitative methods: A
	pragmatic approach. Sage publications.
	9. Gorard, S. (2003). Quantitative methods in social science research. A&C Black.
	10. Teo, T. (Ed.). (2014). Handbook of quantitative methods for educational
	research. Springer Science & Business Media.

11. Davies, M. B., & Hughes, N. (2014). Doing a successful research project:
Using qualitative or quantitative methods. Bloomsbury Publishing.
12. Lampard, R., & Pole, C. (2015). Practical social investigation: Qualitative and
quantitative methods in social research. Routledge.

Module name:	Information Security Fundamentals								
Code									
Trimester	8								
Person	Assoc. Prof.	M Sarinov	a Asiya	l Zhum	abaev	na PhD			
responsible									
for the module									
Lecturer(s)	Otarbay Zhe	nis PhD ca	ndidate	in Rob	otics				
	Kulbaeva La	Kulbaeva Laura MSc in Information systems							
	Aldosh Balzi	iya MSc			•				
	Kutubaeva N	ladina MS	с						
Language	English								
Relation to	Bachelor p	rogrammes	s: Big	Data	Ana	alysis,	Software	Engineering, IT	
curriculum	Management	. (Progran	imes un	ider acc	credite	ation ar	e listed)		
	Compulsory	course.							
Type of	Lectures se	erve to in	troduc	e new	cond	cepts a	nd provid	le theoretical and	
teaching	methodologi	cal foundat	tions.				*		
	Practice ses	sions (sem	inars) a	are activ	ve ses	sions to	develop s	tudent's confidence	
	through new	examples	and dise	cussion	s on t	he prob	lems.		
	Instructor-s	upervised	indep	endent	t stud	iy (ISI	(S) deals	with review and	
	exploration 1	n greater d	epth of	the cou	irse m	aterial.		a the time a nearline d	
	to prepare fo	r and comr	l study Mete all	(313):	36666	sments		ig the time required	
Workload of				course	45505	511101115.	,		
course	ECTS	Cont	act hou	rs	ISIS	SIS	Total hor	ırs	
components	credits	Lecture	Practi	ce	1		10001100		
and credits per		s	sessio	ons					
trimester	5	30	2	20	10	90	150		
Course	Denie 1	A	4	N1		D	F	C -1 - 1-1-	
forms of	Period	Assessme	ent	Numi	ber into	Exam	Form	(Waalv #)	
examination	1 st	Problem	Sets	30	mis	Submi	ssion of	(Weekly	
examination	attestation		5015	30		writter	n reports	WEEKIY	
		Ouiz		30		Writte	n	3 rd week	
		Mid-term	1	40		Writte	n	5 th week	
		Exam	-			*******			
		1 st attest	ation	100					
		total							
	2nd	Problem	Sets	30		Submission of		Weekly	
	attestation					writter	n reports		
		Quiz		30		Writte	n	8 th week	
		End-term	l	40		Writte	n	10 th week	
		Exam							

	21	nd attactation	100					
		allestation	100					
	Final Exam	Jtal	100	Written	During final			
			100	witten	During milar			
	Cumulative tot	al for the cours	e = 0.3 *	$1^{st} \Delta tt + 0.3 * 2^{nc}$	1 $\Delta tt + 0.4$ *Final =			
			C 0,5	1 Au + 0, 5 2	Au + 0,+ 1 mai			
	100.							
Requirements	Course and un	iversity nolici	ies includ	۵.				
according to the		nversity pone	ics meruu					
	Attendance is	mandatory. M	lissing 30 ^r	% of lessons wi	ll result in F (Fail)			
examination								
regulations	grade (or sum	mer school).						
	Late submission	ns are not acce	nted					
			pieu.					
	No cheating, d	uplication, fal	sification	of data, plagia	rism, and crib			
		T 4 4	1 /	1 /				
	Contacting the	e Lecturer: stu	dents are	welcome to arra	nge one-to-one			
	meetings with t	the teacher dur	ing office	hours to discuss	the class.			
Recommended	_							
prerequisites								
Module	The purpose of	Information Se	curity Fun	damentals is to r	provide students with a			
objectives/inten	basic understand	ding of inform	ation secu	rity. We take a h	nigh-level overview of			
ded learning	subjects, includi	ing risk manage	ement, seci	urity policies, fu	ndamental networking,			
outcomes	password cracki	ing, cryptograp	hy, malwa	re, mobile securi	ty, and more. The first			
	subjects student	ts in networkin	ng classes	cover are stand	dard network devices,			
	TCP/UDP, firew	valls, and netwo	ork topolog	gy. From there, t	he student will be able			
	to comprehend	the value of	data prot	ection and the	usual procedures and			
	guidelines follow	wed by informa	tion secur	ity professionals.	. Students will next get			
	an overview of v	various offensiv	ve security	subjects, includi	ing malware, password			
	cracking, sniffe	er, and more!	The stude	nts will be expo	osed to offensive and			
	defensive them	es to help the	n select a	reas of interest.	This is excellent for			
	students leaving	g IT roles or tho	se looking	to move careers				
	After completin	ng this, student	ts need to	be able to:				
	Recognize the fu	inaameniais oj	computer i	networking				
	Recognize junut	imeniui crypiog	grupny vackin a tao	hniquas				
	The students wi	ll get a summar	w of offens	nniques. sive security issu	es including malware			
	nassword cracki	ing sniffer and	more! Thi	is is excellent for	students leaving an IT			
	position or seeki	ing an entirely of	changing c	areer to assist the	e learner: offensive and			
	defensive theme	es will be intr	oduced. S	tudent interests	are identified. By the			
	finish, the pupil	l ought to be p	roficient in	n the knowledge	of the core ideas and			
	procedures invo	lved in informa	tion secur	ity practitioners.				
	The class will	cover essentia	l subjects	such as softwa	are security, computer			
	security concep	ts, trusted syst	ems, inter	net security, mai	nagerial concerns, and			
	cryptography te	chniques.		-				
Content	Important subject	cts will be cove	ered in clas	s such as: softwa	are security,			
	computer securi	ty concepts, and	d trusted s	ystems, internet s	security,			
	managerial conc	cerns, and crypt	ography te	chniques.				
Media	Multimedia clas	ssrooms equipp	ed with con	mputer, projectio	on and audio system;			
employed	Whiteboard; Mi	crosoft Teams;	LMS Moc	odle.				

Reading list	Assigned reading materials and presentations should be read prior to class. Class lectures and discussions will proceed with supplemental and advanced topics, which could be difficult to understand unless students have read the assigned material. Readings are listed in the schedule section. All necessary updates and / or changes to the course will be reflected in the Learning Management System (moodle.astanait.edu.kz). <u>Basic Literature</u> : o Lecture slides (available on moodle.astanait.edu.kz);
	Wright, C. (2016). Fundamentals of Information Security Risk Management
	Auditing. IT Governance Ltd.

Module name:	IT Risk Man	agement					
Semester(s) in which the module is taught	8						
Person responsible for the module	Madina Tulemissova, Senior-lecturer						
Language	English						
Relation to curriculum	Big Data Analytics - Elective course.						
Teaching methods	Lecture, class discussions, group project, individual assignments, case-study, quiz						
Workload (incl. contact hours,	ECTS	Cont	act hours	ISIS	SIS	Total hours	
self-study hours)	credits	Lectures	Practice sessions				
	5	20	30	10	90	150	
Credit points	5						
Required and recommended prerequisites for joining the module	Management, Project Management, IT Operations Management						

Module objectives/intended	By the end of this course students will attain the following				
learning outcomes	learning outcomes.				
	The student will show a working knowledge in:				
	• The fundamentals of risk management				
	Risk Identification				
	Risk assessment				
	• Risk response				
	Risk monitoring and reviewing				
	Students will have the skill to				
	define risk management				
	• recognize why it's important to set the context and				
	objectives for the risk management process				
	• recognize why it's necessary to apply a risk management				
	process in a project, and				
	• summarize and classify each step of the risk management				
	• identify risks in achieving objective outcomes				
	• identify categories of risk, and				
	• select methods to identify risks.				
	• recognize the process of undertaking a risk assessment of identified risks				
	• select risk controls through risk assessment				
	• use a risk matrix to respond to identified risks				
	• clarify risks to stakeholders				
	• use contingencies to deal with risk				
	• identify methods of treating risk				
	• design a Communications Plan to include all stakeholders				
	in the management of identified and assessed risks, and				
	• design a Risk Management Plan.				
	• recognize the importance of a monitor and review process				
	• use a monitor and review process				
	• integrate a monitor and review process that sets targets				
	• obtain and use feedback for continuous improvement, and				
	• select steps for continuous improvement.				
	In terms of Competences, students will be able to				
	• know how the risk management process works as part of a				
	compliance framework				
	• Use frameworks to identify, assess and analyze risks in a business context				
	apply appropriate risk responses				
	design and integrate strategies for reporting and				
	communicating risks to various stakeholders				
	• use a monitor and review process, and apply risk				
	management as an iterative process.				
Content	The course covers the area of risk management in the context of a project. It highlights the importance of rick management and the				
	need for project managers to think about it in advance. The course				
	contains hasic risk management theories and concents annlicable				
	to the project environment including planning preparing and				
	responding to project risks. The course covers the areas of risk				
	identification, assessment, monitoring and control. As part of this				
	course, students will be introduced to methods of qualitative and				
	quantitative risk analysis.				

Exams and assessment formats	Period	Assignments	Number of points	Total Weights			
	Midterm	Individual	orpoints	vv eights			
	1110001111	assignments	60	30%			
		Midterm quiz	40				
	Endterm	Individual					
		assignments	10	30%			
		Group project:					
		Risk Management					
		Plan	10				
		Risk Identification					
		(Risk Register)	20				
		Qualitative Risk	•				
		Analysis (Matrix)	20				
		Risk Response Plan	20				
		Endterm	20				
		(Dresentation)	20				
	Final Exam	(Fresentation)	100	40%			
	Tillal Exam	0.3 * Midterm + 0.3	Fndterm	+01 * Final			
	10tai	Exam	Enuterm	, 0,4 Fillal			
Study and examination	Assessment is a	administered continuou	sly througho	ut the course.			
requirements	The students ar	e rated against their pe	rformance in	continuous			
	rating administ	ered throughout the ser	mester (60%)	and			
	summative rati	ng done during the exa	mination sess	sion (40%),			
	total 100%. Co	ontinuous rating is stud	ents' on-goin	g performance			
	in class and independent work. Class work is assessed for						
	attendance, lab	oratory works' defense	and in- class	assessments.			
Reading list	• Mulcar	iy, Rita (2019): Risk M	anagement, 3	rd edition, Rmc			
	Publis Inc.	n C. Davindranath (20	()(6): Applied	Software Dick			
	Management: 4	A Guide for Software P	Project Manag	ers 1st Edition			
	Interna	tional Project Manag	vement Asso	ciation IPMA			
	(2015): Individ	ual Competence Basel	ine 4th versio	on (ICB4)			
	• ISO (2012): ISO 21500	- Guidanc	e on project			
	management.	.)		1 5			
	• Project	Management Institut	te (2017): A	guide to the			
	project management body of knowledge (PMBOK guide) Sixth						
	edition; Agile p	practice guide. Newtow	n Square, PA	N			
	• J. Her	marij, Better Practice	es of Projec	t Management			
	(2016), 4th ful	ly revised edition. Bas	ed on IPMA	Competences -			
	ICB Version 4						

Module name:	Cloud Computing
Code	
Trimester	8
Person	Aldiyar Salkenov, Senior Lecturer, Master of Engineering in Information
responsible	Technology
for the module	
Lecturer(s)	Elvira Aitmukhanbetova, MSc in Computer Science
	Meruyert Nurgazy, MSc in Software Engineering
Language	English

Relation to	Bachelor programmes: Computer Science, Software Engineering								
Type of teaching	Lectures serve to introduce new concepts and provide theoretical and methodological								
-) [foundations. Practice sessions (seminars) are active sessions to develop student's confidence								
	through new	examples a	nd disci	issions	on the	probler	ns.	tudent s'eonnachee	
	Instructor-s	upervised i	ndepen	dent st	udy (I	SIS) de	als with rev	view and exploration	
	in greater dep	oth of the co	ourse ma	aterial.	· ·	,		1	
	Student's independent study (SIS): Self-study time including the time required to prepare for and complete all course assessments.								
Workload of	Propuse for and complete an course appenditure.								
course	ECTS Contact hours ISIS SIS Total hours								
components and	credits	Lecture	Practi	ce					
credits per		s	sessio	ns					
trimester	5	30	2	0	10	90	150		
Course									
assessment and	Period	Assessme	ent	Numb	ber	Exam	Form	Schedule	
forms of		type		of poi	ints			(Week #)	
examination	1 st	Quiz 1		15		Multip	le Choice	Week 2	
	attestation					Questi	ons		
		Quiz 2		15		Multip	le Choice	Week 4	
				10		Questi	ons	W. 1.0	
		Assignme	ent l	10		Self-ch	necked	Week 2	
		Aggionma		10		laboral	ory work	Weels 2	
		Assignme		10		laborat	ory work	WEEK 5	
		Assignme	ent 3	10		Self-cl	ecked	Week 4	
			Sint 5	10		laborat	orv work	WOOK I	
		Mid-term	Exam	40		Multip	le Choice	Week 5	
						Questi	ons		
		1 st attesta	ation	100					
		total							
	2nd	Quiz 3		15		Multip	le Choice	Week 7	
	attestation			1.5		Questions		W. 1.0	
		Quiz 4		15		Multip	le Choice	Week 9	
		Assignme	ent A	10		Questi Self cl	ons becked	Week 6	
		Assignin	-111 4	10		laborat	orv work	WEEKO	
		Assignme	ent 5	10		Self-cl	necked	Week 8	
		8				laborat	ory work		
		Assignme	ent 6	10		Self-ch	necked	Week 9	
						laborat	ory work		
		End-term	Exam	40		Multip	le Choice	Week 10	
						Questi	ons		
		2 nd attest	ation	100					
	Final	Final test		30		Multin	le Choice	During final	
	Exam					Questi	ons	exam session	
		Final proj	ject	70		À proj	ect	During final	
								exam session	
		Final tota	al	100					
						-			
	Cumulative	total for the	e course	e = 0,3	* 1 st A	tt + 0,3	* 2^{nu} Att +	0,4*Final = 100.	

Requirements according to the examination regulations	Course and university policies include: Attendance is mandatory. Missing 30% of lessons will result in F (Fail) grade (or summer school). Late submissions are not accepted. No cheating, duplication, falsification of data, plagiarism, and crib Contacting the Lecturer: students are welcome to arrange one-to-one meetings with the teacher during office hours to discuss the class.					
Recommended	Software Architecture, Advanced Programming, DBMS, Computer Organization					
prerequisites	and Architecture					
Module	Students will show a working knowledge in:					
ded learning	• different types of cloud computing models					
outcomes	• advantages that cloud computing provides over a traditional, on-premises					
outcomes	the main AWS complete entergories and core completes					
	 the main A w S service categories and core services aloud aconomics and billing including a new as you go model, total cost of 					
	ownership AWS organizations and cost management					
	 cloud global presence including AWS global infrastructure 					
	• cloud security and concepts such as shared responsibility model, access					
	management, account security, data security using encryption, and compliance					
	regulations					
	• networking concepts such public and private networks, subnets, IPv4 and IPv6 addresses, CIDR notation, internet gateways, and endpoints					
	• key concepts of high-level cloud computing including elastic computing,					
	containers, virtual machines and serverless solutions					
	• various storage types including block storage, file storage and object storage					
	• cloud database services including managed and unmanaged services, relational non-relational databases					
	 cloud architecture design principles and best practices such as scalable, dynamic architectures using traffic distribution and manitoring technologies 					
	dynamic arcmeetures using traine distribution and monitoring technologies					
	Students will have the skills to:					
	• set up AWS accounts, work with provisioning management software and launch instances on Amazon EC2					
	• manage users and user permissions in AWS					
	• set up an organizational structure that simplifies billing and account visibility					
	to review cost data					
	• create resizable compute capacity in the cloud using Amazon EC2					
	• create a virtual private network and add additional components to produce a customized network					
	• mitigate varying loads on the server using Elastic Load Balancing and Auto					
	Scaling at AWS					
	• create an Amazon EBS volume, attach it to an instance, apply a file system					
	to the volume, and then take a snapshot backup					
	• demonstrate when to use AWS Database services including Amazon					
	Amazon Aurora					
	In terms of Competences, students will be able to					
	• explain the core concepts of the cloud computing paradigm: how and why					
	this paradigm shift came about, the characteristics, advantages and challenges					
	brought about by the various models and services in cloud computing					
	• identify the architecture and infrastructure of cloud computing, including					
	SaaS. PaaS. JaaS. public cloud, private cloud, hybrid cloud, et					

 demonstrate a solid understanding of what AWS is, what its many services are all about (and what each service does) and which kind of service (or service combination) may be used to implement meet IT or application requirements build IT solutions using cloud technologies by implementing computing, storage, database, networking and management services
This course provides a hands-on comprehensive study of cloud concepts and capabilities across the various cloud service models including Software as a Service (SaaS), Infrastructure as a Service (IaaS) and Platform as a Service (PaaS). Cloud computing is introduced through Amazon Web Services (AWS) and its capabilities. Through a combination of presentations, demos, and hands-on labs, students get an overview of AWS and a detailed view of the computing and storage capabilities. Additionally, this course showcases the ease, flexibility, and power of serverless solutions on AWS.
Multimedia classrooms equipped with computer, projection and audio system; Whiteboard; Microsoft Teams; LMS Moodle; AWS Learning Academy
 Basic Literature: 1. Cloud Computing: Principles and Paradigms, Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Wiley, ISBN 978-0470887998, 2011 2. Amazon Web Services in Action, Andreas Wittig, Michael Wittig, Manning Publications Co., ISBN 978-1617292880, 2016 Supplementary literature: 1. Learn AWS Serverless Computing, Scott Patterson, Packt Publishing, ISBN 978- 1780058255, 2010

Module name:	Deep learning and reinforcement learning						
Code							
Trimester	8						
Person responsible for the module	Nurakhov Ye	dil, Master	of Science				
Lecturer(s)	Nurakhov Ye	dil, M.Sc.					
Language	English						
Relation to curriculum	Bachelor prog	grammes: E	3ig Data Analy	ysis			
		course.					
Type of teaching	Lectures serve to introduce new concepts and provide theoretical and methodological foundations.						
	Practice sessions (seminars) are active sessions to develop student's confidence						
	Instructor-supervised independent study (ISIS) deals with review and exploration						
	in greater depth of the course material.						
	Student's independent study (SIS): Self-study time including the time required to						
	prepare for ar	nd complete	e all course as	sessmen	ts.		
Workload of					1	1	-
course	ECTS	Cont	tact hours	ISIS	SIS	Total hours	
components and	credits	Lecture	Practice				
credits per		S	sessions				_
trimester	5	30	20	10	90	150]

Course						
assessment and	Period	Assessment	Number	Exam Form	Schedule	
forms of		type	of points		(Week #)	
examination	1 st	Problem Sets	30	Submission of	Weekly	
	attestation		50	written reports	weekiy	
	ditestation	Ouiz	30	Written	3 rd week	
		Mid term Exem	40	Written	5 th week	
			40	written	J WEEK	
		1 st attestation total	100			
	2nd	Problem Sets	30	Submission of	Weekly	
	attestation	Quiz 30		Written	8 th week	
		End-term Exam	40	Written	10 th week	
		2 nd attestation	100			
		total				
	Final Exam		100	Written	During final exam session	
	Cumulative	total for the course	$e = 0.3 * 1^{st}$	$Att + 0.3 * 2^{nd} Att -$	+ 0,4*Final = 100.	
			-)-	-)-		
Requirements	The exam wi	ll take the form of	a test. The te	et consists of 16 au	estions The	
according to the	allocated tim	e for the test is 30 i	ninutes	st consists of 10 qu	estions. The	
examination	Course and	university nolie	innucs.			
regulations	Course and university policies include:					
regulations	Attendance	e is mandatory. N	lissing 30%	o of lessons will	result in F (Fall)	
	grade (or s	ummer school).				
	Late submissions are not accepted.					
	No cheating, duplication, falsification of data, plagiarism, and crib					
	Contacting the Lecturer: students are welcome to arrange one-to-one					
	meetings with the teacher during office hours to discuss the class.					
Recommended	Linear Algebra, Calculus I, Calculus II, Discrete mathematics. Machine learning					
prerequisites	algorithms. Object oriented programming. Algorithms and data structures					
Module	argorithms, Object oriented programming, Argorithms and data structures					
objectives/inten	By the end of this course students will ottoin the following learning out-surge					
ded learning	by the end of this course students will attain the following learning outcomes.					
ded learning		will show a worki			-1:	
outcomes	 Data preparation: data collection, normalization, and scaling Understanding the problems of classification, clustering, and regression Understanding the main deep learning metrics Understanding the types and methods of forming neural networks and 					
	analyzing the	e tasks that require	their applicat	tion		
	• Unde	erstanding of optim	ization meth	ods		
	• Unde	erstanding data repr	resentation for	or training a neural	network model in the	
	context of a s	specific task				
	• Unde	erstanding the main	aspects of re	einforcement learni	ng	
	• Unde	erstanding the met	hods of pres	senting information	about the learning	
	environment	C	I	č	8	
	• Unde	erstanding policy of	otimization to	echniques and strat	egy selection	
	 Challestanding poincy optimization techniques and strategy selection Students will have the skills to Transform the original input and output data to train the neural network 					
	model					
	• Choice of network topology in the context of the task					
	• Choo	osing the type of ne	ural network	[
	• Choi	ce of activation fun	ction in the	context of the probl	em being solved	

	• Analyze the results of the constructed model				
	• Draw conclusions from the analysis of the constructed model				
	• Understanding the main parameters of reinforcement learning: environment, agent action reward				
	• Understanding of the main calculated characteristics: average expected				
	reward, average future reward				
	• Understanding the basic methods of policy optimization: Monte Carlo method, application of the Bellman optimality equation				
	In terms of Competences, students will be able to				
	• Collection, preprocessing and preparation of data for building a model				
	• Choose a solution, a method for building a neural network model to solve the				
	problem				
	Analyze trained model				
	• Select a task view model				
	• Work with standard API for reinforcement learning, and a diverse collection of reference environments				
	Select Policy Optimization Method				
Content	The aim of the course is to develop knowledge and skills in various research methods, tools and problems in the field of Deep and Reinforcement Learning. They range from qualitative to quantitative methods and cover perspectives from engineering and natural sciences to even the arts and humanities. The course will prepare the student to analyze and implement new methods of Deep and Reinforcement Learning.				
Media	Multimedia classrooms equipped with computer, projection and audio system; Whiteboard: Microsoft Teams: LMS Moodle				
employed	winteboard, wierosoft reality, Elvis wioodie.				
Reading list	Basic Literature				
1100001181100	29. Richard S. Sutton and Andrew G. Barto. Reinforcement Learning: An				
	Introduction. Second edition. 2017, Cambridge, Massachusetts.				
	30. Sheldon Ross. Introduction to Probability and Statistics for Engineers and				
	Scientists. 5th edition. 2014, Elsevier.				
	31. Aurélien Géron. Hands-On Machine Learning with Scikit Learn and				
	TensorFlow 2019, O'Reilly Media, Inc.				
	Supplementary sources:				
	<u>http://stevenmiller888.github.io/mind-how-to-build-a-neural-network/</u>				
	• <u>https://mattmazur.com/2015/03/17/a-step-by-step-backpropagation-example/</u>				
	<u>https://habr.com/ru/company/otus/blog/429090/</u>				
	• https://gb.ru/blog/algoritmy-obucheniya-nejronnoj-seti/				