MODULE HANDBOOK

BSc in Computer Engineering

CONTENTS

Computer engineering bachelor program, Department of "History"

Course Unit Title	History of Azerbaijan
Course Unit Code	ÜF-B01
Type of Course Unit	Compulsory
Level of Course Unit	2th year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hours/week)	2
Practice (hours/week)	2
Laboratory (hours/week)	
Year of Study	2
Semester when the course unit is delivered	4
Course Coordinator	Gunel Rahimli Ashraf
Name of Lecturer(s)	Gunel Rahimli Ashraf
Name of Assistant(s)	-
Delivery Method	Face to face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

1. This subject teaches actual problems, main stages, important events, political, military, ideological, cultural, demographic and ethnic processes of the history of Azerbaijan in the context of the general history of the Eastern world and the Caucasus.
2. By making comparisons and parallels, students are formed the ability to correctly analyze the historical events that happened in different periods and draw logical conclusions.

Course Objectives:

During the course of study, the history and culture of Azerbaijan, domestic and foreign policy, relations with other countries, etc. will be considered. This handbook provides essential information including expected learning, subject content and assessment details during the course. You should read carefully and follow closely during the subject.

Learning Outcomes

At the end of the course the student will be able to	Assessment

1	recognize historians-researchers who play an important role in writing the history of Azerbaijan, to introduce their scientific direction and scientific results to students	1, 2
2	Demonstrate logical and consistent knowledge	1, 2
3	Write a research paper on the topic in accordance with the methods of scientific research	1, 2
4	connect historical events with modern times, to draw conclusions	1, 2
5	apply the methods of comparative analysis, analysis and synthesis	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to apply natural science and general engineering knowledge, methods of mathematical analysis and modeling in engineering activities related to the design, construction and production of devices, systems and complexes	2
2	ability to understand the operating principles and functional capabilities of electronic devices, especially semiconductor ones, and also be able to analyze circuits and calculation methods for microelectronic elements	3
3	ability to work with computer models, drawings and graphic tools (for example, AUTOCAD), as well as understand the requirements of standards and principles of drawing	4
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	2
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	2
6	ability to use various types of devices to monitor and control technological processes	2
7	ability to plan, conduct experiments in project work and research, as well as perform and present targeted processing of the results obtained in order to obtain valid results	2
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	2
9	ability to carry out professional activities taking into account economic, environmental, social, intellectual, legal and other restrictions at all stages of the life cycle of technical objects and processes	5
10	ability to use foreign language skills to obtain the necessary scientific and technical information. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam

1		AZERBAIJAN IN PREHISTORY TIME Seminar 1	
2		ANCIENT STATES OF AZERBAIJAN. MANNA, ATROPATENA, ANCIENT ALBANIA Seminar 2	
3		AZERBAIJAN IN THE III-VII CENTURIES Seminar 3	
4		AZERBAIJAN UNDER THE ARAB CALIPHATE Seminar 4	
5		AZERBAIJAN IN THE 9TH TO THE EARLY 13RD CENTURIES Seminar 5	
6		AZERBAIJAN IN THE 14TH CENTURY TO 15TH CENTURIES Seminar 6	
7		AZERBAIJAN SAFAVID STATE Seminar 7	
8		KHANATES OF AZERBAIJAN Seminar 8	
9		AZERBAIJAN IN THE XIX CENTURIES Seminar 9	
10		AZERBAIJAN IN THE FIRST DECADES OF THE 1900s Seminar 10	
11		AZERBAIJAN DEMOCRATIC REPUBLIC (1918-1920) Seminar 11	
12		AZERBAIJAN IN THE 1920-1930s Seminar 12	
13		AZERBAIJAN DURING THE WORLD WAR II AND AFTER THE WAR Seminar 13	
14		INDEPENDENT AZERBAIJAN REPUBLIC (1991- 2020s.) Seminar 14	
15		THE SECOND GARABASH WAR AND THE VICTORY OF AZERBAIJAN Seminar 15	

Recommended Sources

TEXTBOOK(S)

1. History of Azerbaijan. Ed. M.Abdullayev. Baku, 2015, 2019 412 p.
2. The History of the Caucasian Albanians" by Movses Khorenatsi (translated by RW Thomson)
3. Sources on the history of Azerbaijan. Edited by SS Aliyarov and YMMahmudov. Baku, Chirag, 2007. 400 p.
4. The Politics of Culture in Soviet Azerbaijan, 1920-40, Audrey Altstadt, Published January 12, 2018 by Routledge
5. The Azerbaijani Turks: Power and Identity under Russian Rule, Audrey Altstadt, Publisher Hoover Institution Press; 1992

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Activities	Number	Duration (hours)	Total Workload(hours)
Total Workload			**150**
Total Workload/30(h)			**150/30**
ECTS Credits of the Course			**5**

Computer Engineering bachelor program, Department of "English Language Centre"

Course Unit Title	Business and Academic Communication in a Foreign Language-1
Course Unit Code	ÜF-B02.01
Type of Course Unit	Compulsory
Level of Course Unit	1st year
National Credits	
Number of ECTS Credits Allocated	7
Theoretical (hours/week)	-
Practice (hours/week)	7
Laboratory (hours/week)	-
Year of Study	1
Semester when the course unit is delivered	1
Course Coordinator	Jala Asgarova
Name of Lecturer(s)	Jala Asgarova
Name of Assistant(s)	-
Delivery Method	Face to Face
Language of Instruction	English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

This course has been designed to provide you, whose first language is not English, with the opportunity to obtain an appropriate level in the English language. The course offers progression for students who seek to develop and enhance their skills in reading, writing, speaking and listening in English. It helps students expand their outlook, enrich vocabulary stock, express their ideas in English effectively. It also focuses on reading comprehension, vocabulary development, effective academic writing and improving speaking skills.

Course Objectives:

The aims of the course are:

- expand skills in reading, writing, listening and speaking in English
- enrich understanding of how language works
- enhance confidence in interacting with others in a variety of contexts using the English language
- increase linguistic knowledge of specific aspects of work or study in contexts where English is the center of communication
- read and understand texts you will meet in your degree studies

Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	The student will grow in their ability to use English to communicate effectively with others in all disciplines	1, 2
2	While reading, the student will be able to understand very short, simple texts. They will be able to find specific, predictable information in simple everyday material such as advertisements, menus and timetables. They will be able to read short simple personal letters	1, 2
3	When writing, the student will be able to produce short, simple notes and messages that relate to matters of immediate concern. They will be able to write a simple personal letter such as a thank-you letter	1, 2
4	When speaking, the student will be able to produce a series of phrases and sentences to describe in simple terms things like his/her family, other people, living conditions, educational background or a present or previous job	1, 2
5	While listening, the student will be able to understand phrases and the highest frequency vocabulary related to areas of personal relevance such as very basic personal and family information, shopping, local area, employment. The student will be able to understand the main point in short, clear, simple messages and announcements	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	3
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	5
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	2
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	2
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	2
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2

9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	5
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	5

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

	Chapter	Topics	Exam
1		**Unit 1.**Marketing-Reading 1; Reading skill; Work with the video	
2		**Unit 1.**Marketing-Reading 2; Critical Thinking Strategy; Vocabulary Skill	
3		**Unit 1.**Marketing-Writing skill; Grammar: Present Continuous; Unit assignment	
4		**Unit 1.**Business and Marketing: Note-taking Skill, Listening 1; Listening Skill, Critical Thinking Strategy; Listening 2; Work with the video; Vocabulary Skill	
5		**Unit 1.**Business and Marketing: Grammar: The present continuous; Pronunciation; Speaking skills; Unit Assignment	
6		**Unit 2.**Psychology - Reading 1; Reading skill; Work with the video	
7		**Unit 2.**Psychology - Reading 2; Critical Thinking Strategy; Vocabulary Skill	
8		**Unit 2.**Psychology-Writing skill; Grammar: Future with will; Unit assignment	
9		**Unit 2.**Psychology: Listening 1; Note-taking Skill, Listening Skill, Critical Thinking Strategy; Listening 2; Work with the video; Vocabulary Skill	
10		**Unit 2.**Psychology: Speaking skills; Grammar: There is and it is; Pronunciation; Unit Assignment	
11		**Unit 3.**Social Psychology -Reading 1; Reading skill; Work with the video	
12		**Unit 3.**Social Psychology - Reading 2; Vocabulary Skill	
13		**Unit 3.**Social Psychology-Writing skill; Grammar: Subject-verb agreement; Unit assignment; Critical Thinking Strategy;	
14		**Unit 3.** Social Psychology: Listening 1; Note-taking Skill, Listening Skill, Critical Thinking Strategy; Listening 2; Work with the video; Vocabulary Skill	
15		**Unit 3. Social Psychology: Speaking skill,**Grammar: Modal verbs should and shouldn`t; Pronunciation;; Unit Assignment	
16		**Practice:**Handling Complaints & Problem Solving	
17		**Practice:**Asking for & giving directions	
18		**Review (Units 1-3)**	

19		**Achievement – 1**	
20		**Unit 4.**Technology -Reading 1; Reading skill; Work with the video	
21		**Unit 4.**Technology - Reading 2; Vocabulary Skill	
22		**Unit 4.**Technology-Writing skill; Grammar: Modals; Unit assignment; Critical Thinking Strategy;	
23		**Unit 4.**Technology: Listening 1; Note-taking Skill, Listening Skill, Critical Thinking Strategy; Listening 2; Work with the video; Vocabulary Skill	
24		**Unit 4. Technology: Speaking skills;** Grammar: Comparatives; Pronunciation; Unit Assignment	
25		**Unit 5.**Business-Reading 1; Reading skill; Work with the video	
26		**Unit 5.**Business - Reading 2; Vocabulary Skill	
27		**Unit 5.**Business-Writing skill; Grammar: Comparative and Superlative adjectives; Unit assignment; Critical Thinking Strategy;	
28		**Unit 5.** Sociology: Listening 1; Note-taking Skill, Listening Skill, Critical Thinking Strategy; Listening 2; Work with the video; Vocabulary Skill	
29		**Unit 5. Sociology: Speaking skill**Grammar: Auxiliary verbs in questions; Pronunciation; Unit Assignment	
30		**Unit 6.**Brain Science-Reading 1; Reading skill; Work with the video	
31		**Unit 6.**Brain Science -Reading 2; Critical Thinking Strategy; Vocabulary Skill	
32		**Unit 6.**Brain Science-Writing skill; Grammar: Infinitives of purpose; Unit assignment	
33		**Unit 6.**Behavioral Science: Listening 1; Note-taking Skill; Listening Skill, Critical Thinking Strategy; Listening 2; Work with the video; Vocabulary Skill	
34		**Unit 6.**Behavioral Science: Speaking skill Grammar: Imperative verbs; Pronunciation; Unit Assignment	
35		**Practice:**Social media & Digital Communication	
36		**Practice:**Learning from TV shows & movies	
37		**Review (Units 4-6)**	
38		**Achievement – 2**	
39		**Unit 7.**Environmental Science-Reading 1; Reading skill; Work with the video	
40		**Unit 7. Environmental Science**-Reading 2; Critical Thinking Strategy; Vocabulary Skill	
41		**Unit 7. Environmental Science**-Writing skills; Grammar: Simple Past and Past continuous; Unit assignment	
42		**Unit 7. Environmental Science**: Listening 1; Note-taking Skill, Listening Skill, Critical Thinking Strategy; Listening 2; Work with the video; Vocabulary Skill	
43		**Unit 7. Environmental Science**: Speaking skill; Grammar: Future with will; Pronunciation; Unit Assignment	

44		**Unit 8.**Public Health-Reading 1; Reading skill; Work with the video	
45		**Unit8.**Public Health-Reading 2; Critical Thinking Strategy; Vocabulary Skill	
46		**Unit8.**Public Health-Writing skill; Grammar Adverbs of manner and degree; Unit assignment	
47		**Unit8.**Public Health: Listening 1; Note-taking Skill, Listening Skill, Critical Thinking Strategy; Listening 2; Work with the video; Vocabulary Skill	
48		**Unit8.**Public Health: Speaking skill; Grammar: If clauses for future possibility; Pronunciation; Unit Assignment	
49		**Practice:**Storytelling&Fluency development	
50		**Practice:**Modern English & Everyday expressions	
51		**Review (units 7-8)**	
52		**Achievement – 3**	
53		**PREPARATION FOR FINAL**	

Recommended Sources

TEXTBOOK(S)

1. Q: Skills for Success (Reading and Writing) Level 2: Third Edition / Joe McVeigh/ Jennifer Bixby / Oxford University Press, 2020
2. Q: Skills for Success (Listening and Speaking) Level: Third Edition / Margaret Brooks / Oxford University Press, 2020
3. English Vocabulary in Use Elementary Third Edition/Michael McCarthy, Felicity O'Dell/ Cambridge University Press, 2017
4. Basic Oxford Practice Grammar / Norman Coe, Mark Harrison, Ken Paterson/ Oxford University Press 2019
5. Reading & Vocabulary Development 1: Facts & Figures, Fourth Edition / Patricia Ackert and Linda Lee
6. Essential Grammar in Use Fourth edition/ Raymond Murphy/ Cambridge University Press 2015

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

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Course Policies • Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations	
ECTS allocated based on Student Workload	
Total Workload	**210**
Total Workload/30(h)	**210/30**
ECTS Credits of the Course	**7**

Computer Engineering bachelor program, Department of "English Language Centre"

Course Unit Title	Business and Academic Communication in a Foreign Language-2
Course Unit Code	ÜF-B02.02
Type of Course Unit	Compulsory
Level of Course Unit	1st year
National Credits	
Number of ECTS Credits Allocated	8
Theoretical (hours/week)	-
Practice (hours/week)	8
Laboratory (hours/week)	-
Year of Study	1
Semester when the course unit is delivered	2
Course Coordinator	Jala Asgarova
Name of Lecturer(s)	Jala Asgarova
Name of Assistant(s)	-
Delivery Method	Face to Face
Language of Instruction	English
Prerequisites	-

Recommended Optional Program Components	-

Course description:

This course has been designed to provide you, whose first language is not English, with the opportunity to obtain an appropriate level in the English language. The course offers progression for students who seek to develop and enhance their skills in reading, writing, speaking and listening in English. It helps students expand their outlook, enrich vocabulary stock, express their ideas in English effectively. It also focuses on reading comprehension, vocabulary development, effective academic writing and improving speaking skills.

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- increase linguistic knowledge of specific aspects of work or study in contexts where English is the center of communication
- read and understand texts you will meet in your degree studies

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	The student will grow in their ability to use English to communicate effectively with others in all disciplines.	1, 2
2	While listening, the student will be able to understand phrases and the highest frequency vocabulary related to areas of personal relevance such as very basic personal and family information, shopping, local area, employment. The student will be able to understand the main point in short, clear, simple messages and announcements.	1, 2
3	While reading, the student will be able to understand very short, simple texts. They will be able to find specific, predictable information in simple everyday material such as advertisements, menus and timetables. They will be able to read short simple personal letters.	1, 2
4	When writing, the student will be able to produce short, simple notes and messages that relate to matters of immediate concern. They will be able to write a simple personal letter such as a thank-you letter.	1, 2
5	When speaking, the student will be able to produce a series of phrases and sentences to describe in simple terms things like his/her family, other people, living conditions, educational background or a present or previous job.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	3
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	5

3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	2
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	2
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	2
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	5
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	5

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

	Chapter	Topics	Exam
1		**Unit 1.**Sociology. How do you make a good first impression? Reading 1: Small talk. Reading Skill: Main ideas and supporting details	
2		**Unit 1.**Sociology. How do you make a good first impression? Reading 2: 21st Century job interviews. Critical Thinking Strategy: A causal chain.	
3		**Unit 1.**Sociology. How do you make a good first impression? Work with the video: Advice on a good first impression Vocabulary skill: Using the dictionary	
4		**Unit 1.**Sociology. How do you make a good first impression? Writing skill: Organizing and developing a paragraph Grammar: Real conditionals. Present and future	
5		**Unit 1.**Sociology. Are first impressions accurate? Note-taking Skill: to summarize a lecture Listening 1: The psychology of first impressions.	
6		**Unit 1.**Sociology. Are first impressions accurate? Listening Skill: Listening for main ideas. Listening 2: A review of books about first impressions.	
7		**Unit 1.**Sociology. Are first impressions accurate?	

		Work with the video: Interview mistakes. Vocabulary skill: suffixes. Grammar: Auxiliary verbs: do, be, have	
8		**Unit 1.**Sociology. Are first impressions accurate? Pronunciation: Contractions with helping verbs	
9		**Unit 2**.**Nutritional science. What makes food attractive?** Reading 1: Knowing your taste. Reading skill: previewing a text	
10		**Unit 2**.**Nutritional science. What makes food attractive?** Reading 2: Eating with our eyes. Critical thinking strategy: Making inferences	
11		**Unit 2**.**Nutritional science. What makes food attractive?** Vocabulary skill: Using content to understand words.	
12		**Unit 2**.**Nutritional science. What makes food attractive?** Writing skill: Writing descriptive adjectives. Grammar: Use and placement of adjectives	
13		**Unit 2**.**Nutritional science. Why do we change the foods we eat?** Listening 1: A billion pounds of spices	
14		**Unit 2**.**Nutritional science. Why do we change the foods we eat?** Critical Thinking Strategy: predicting topics and ideas Listening 2: A world of food	
15		**Unit 2**.**Nutritional science. Why do we change the foods we eat?** Grammar: Quantifiers with count and noncount nouns	
16		**Unit 2**.**Nutritional science. Why do we change the foods we eat?** Pronunciation: links with [j]and [w] Speaking skill: Giving advice	
17		**Unit 3.Information technology. How has technology affected our lives?** Reading 1: Cars that think Reading Skill: taking notes	
18		**Unit 3.Information technology. How has technology affected our lives?** Reading 2: Classrooms without walls	
19		**Unit 3.Information technology. How has technology affected our lives?** Vocabulary skill: Synonyms Writing skill: Writing a summary and personal response	
20		**Unit 3.Information technology. How has technology affected our lives?** Grammar: Parallel structure	
21		**Unit 3.Psychology. In what ways is change good or bad?** Listening 1: Shaped by change, promoting change. Listening skill: Listening for time markers	
22		**Unit 3.Psychology. In what ways is change good or bad?** Critical thinking strategy: summarizing information Listening 2: An interview with Barbara Ehrenreich	
23		**Unit 3.Psychology. In what ways is change good or bad?** Vocabulary skill: a word web Grammar: Tag questions.	
24		**Unit 3.Psychology. In what ways is change good or bad?** Pronunciation: Intonation in tag questions	

		Speaking skill: Asking for and giving reasons	
25		**Unit 4. Marketing. Does advertising help or harm us?** Reading 1: Can targeted ads change you?	
26		**Unit 4. Marketing. Does advertising help or harm us?** Reading 2: In defense of advertising. Work with the Video: How algorithms changed the world?	
27		**Unit 4. Marketing. Does advertising help or harm us?** Vocabulary skill: Synonyms Writing skill: An opinion essay	
28		**Unit 4. Marketing. Does advertising help or harm us?** Grammar: Compound sentences	
29		**Unit 4. Marketing. How does advertising affect our behavior?** Note-taking skill: A mind map to note opinions Listening 1: Targeting children with advertising	
30		**Unit 4. Marketing. How does advertising affect our behavior?** Listening skill: Fact and opinion Listening 2: The influence of online ads	
31		**Unit 4. Marketing. How does advertising affect our behavior?** Vocabulary skill: Context clues to identify meaning Grammar: Modals expressing attitude	
32		**Unit 4. Marketing. How does advertising affect our behavior?** Pronunciation: intonation in questions Speaking skill: Giving and supporting your opinions	
33		**Unit 5**. Psychology. How do people overcome obstacles? Reading 1: How people learn to become resilient. Reading skill: References to understand contrast.	
34		**Unit 5**. Psychology. How do people overcome obstacles? Reading 2: The climb of my life. Work with the video: Shona regains her confidence	
35		**Unit 5**. Psychology. How do people overcome obstacles? Vocabulary skill: Using the dictionary to find the correct meaning.	
36		**Unit 5**. Psychology. How do people overcome obstacles? Writing skill: Writing a narrative essay. Grammar: Shift between past and present time frames.	
37		**Unit 5**. Behavioral science. Does taking risks change our lives? Listening 1: A lifetime of risks	
38		**Unit 5**. Behavioral science. Does taking risks change our lives? Listening Skill: listening for different kinds of numbers Listening 2: Science on the edge.	
39		**Unit 5**. Behavioral science. Does taking risks change our lives? Vocabulary skill: word families Grammar: Past perfect	
40		**Unit 5**. Behavioral science. Does taking risks change our lives? Speaking skill: Giving a short presentation	
41		**Unit 6**. Neurology. Are you a good decision maker? Reading 1: The lazy brain. Reading Skill: using a graphic organizer	
42		**Unit 6**. Neurology. Are you a good decision maker? Reading 2: Problem-solvers.	
43		**Unit 6**. Neurology. Are you a good decision maker? Vocabulary skill: phrasal verbs	

		Writing skill: stating reasons and giving examples	
44		**Unit 6**. Neurology. Are you a good decision maker? Grammar: Gerunds and infinitives	
45		**Unit 6.**Neurology. Will AI ever be as smart as humans? Listening skill: inferring a speaker's attitude Listening 1: What kind of smart is AI?	
46		**Unit 6.**Neurology. Will AI ever be as smart as humans? Listening 2: Asking the right questions about AI	
47		**Unit 6.**Neurology. Will AI ever be as smart as humans? Vocabulary skill: Using the dictionary Grammar: Gerunds and infinitives as the objects of verbs	
48		**Unit 6.**Neurology. Will AI ever be as smart as humans? Speaking skill: Leading a group discussion.	
49		Unit 7.**Economics. Can a business earn money while making a difference**? Reading 1: FEED project. Reading skill: using a timeline	
50		**Unit 7.Economics. Can a business earn money while making a difference**? Reading 2: A new business model. Vocabulary skill: collocations with verbs	
51		**Unit 7.Economics. Can a business earn money while making a difference**? Grammar: Complex sentences Writing skill: Writing a cause/effect essay	
52		**Unit 7.Economics. Can money buy happiness?** Listening 1: Sudden wealth Critical thinking strategy: choosing two or more options	
53		**Unit 7.Economics. Can money buy happiness?** Listening 2: Happiness breeds success Vocabulary skill: idioms Grammar: Types of sentences	
54		**Unit 7.Economics. Can money buy happiness?** Pronunciation: intonation in different types of sentences Speaking skill: agreeing and disagreeing	
55		**Unit 8.**Behavioral studies. What does it take to be successful? Reading 1: Fast cars, big money Reading skill: scanning a text	
56		**Unit 8.**Behavioral studies. What does it take to be successful? Reading 2: Practice makes ... pains. Vocabulary skill: collocations with adjectives+prepositions	
57		**Unit 8.**Behavioral studies. What does it take to be successful? Writing skill: Writing an argumentative essay Grammar: Sentence fragments	
58		**Unit 8.**Behavioral studies. What can we learn from success and failure? Listening 1: Learning from failure Listening skill: listening for examples	
59		**Unit 8.**Behavioral studies. What can we learn from success and failure? Listening 2: An interview with Mohannad Abu-dayyah Vocabulary skill: prefixes Grammar: Simple past and present perfect	

60		**Unit 8.**Behavioral studies. What can we learn from success and failure? Pronunciation: Varying intonation to maintain interest Speaking skill: Asking for and giving clarification	

Recommended Sources

TEXTBOOK(S)

1. Q: Skills for Success (Reading and Writing) Level 3: Third Edition / Colin S. Ward / Margot F. Gramer / Oxford University Press, 2020
2. Q: Skills for Success (Listening and Speaking) Level 3: Third Edition / Miles Craven / Oxford University Press, 2020
3. English Vocabulary in Use Third Edition/Michael McCarthy, Felicity O'Dell/ Cambridge University Press2017
4. Basic Oxford Practice Grammar / Norman Coe, Mark Harrison, Ken Paterson/ Oxford University Press 2019
5. Reading & Vocabulary Development 1: Facts & Figures, Fourth Edition / Patricia Ackert and Linda Lee
6. Essential Grammar in Use Fourth edition/ Raymond Murphy/ Cambridge University Press 2015

Assessment

Attendance	10%	
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**240**
Total Workload/30(h)	**240/30**
ECTS Credits of the Course	**8**

Computer Engineering bachelor program, Department of "Azerbaijani Language and Literature"

Course Unit Title	Business and Academic Communication in Azerbaijani
Course Unit Code	ÜF-B03
Type of Course Unit	Compulsory
Level of Course Unit	1st year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	-
Practice (hours/week)	3
Laboratory (hours/week)	-
Year of Study	1
Semester when the course unit is delivered	1
Course Coordinator	Alesgarova Solmaz Hashim
Name of Lecturer(s)	Alesgarova Solmaz Hashim
Name of Assistant(s)	-
Delivery Method	Face to Face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-

Course description:

The subject "Business and Academic Communication in Azerbaijani" emerged based on a certain need and demand.Correct and fluent use of the Azerbaijani language in accordance with the requirements of the times in the context of globalization, as well as in order to prepare a fluent speech in this language, regardless of specialization, and to convey ideas flawlessly, it is necessary to have a deep knowledge of its phonetic, lexical and grammatical rules and norms and to correctly apply them to written and oral speech. The subject is taught in the form of practical exercises.

Course Objectives:

Within the framework of this subject, special attention should be paid to instilling in students the skills of making presentations in Azerbaijani, public speaking, and academic and business writing.

Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	To acquire information about the Azerbaijani language and the state care shown to it in the context of globalization. To learn how to prepare a presentation on the topic of decrees and orders on the state language, “Great Leader Heydar Aliyev and the Azerbaijani language”; To know the goals and objectives of the subject “Business and Academic Communication in the Azerbaijani Language”. To acquire knowledge about the forms and functions of communication, and levels of communication.	1, 2
2	To master the role of auxiliary parts of speech in the academic communication process; to study the role of oral and written communications, as well as the requirements for speech: accuracy, precision, clarity, fluency, purity, conciseness, simplicity, richness, coherence, and other important issues of speech at the level of modern requirements.	1, 2
3	To know what communication rhetoric consists of, the styles of literary language, the active and passive lexicon of the Azerbaijani literary language. To master literary language and communicability, types of communicability, communication and communicative strategies and creative technologies in communicability.	1, 2
4	To study the culture of listening and the essence of listening as a type of communication. To understand the importance of listening and attention, forms of listening, and improving listening skills; to acquire information about communication culture, conversational ethics, and address etiquette; to know the uniqueness of organized speech (lecture, report, speech, spontaneous speech); to create business communication orally.	1, 2
5	To learn information and rules about the business style of the modern Azerbaijani language; To enrich knowledge about the role of letters in business communication, electronic and online communications; To create written business communication.	1, 2
6	To learn information about the language of official business documents; to acquire information about the types and forms of business communications, as well as their language and style. To learn the purity of the Azerbaijani language in business communication, the essence of observing spelling rules and sentence structure. To acquire theoretical and practical work on business rhetoric.	1, 2
7	Be able to prepare written and oral presentations in the specialty in Azerbaijani.	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	3
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4

3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	2
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	2
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	2
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	5
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	2
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents

Week	Chapter	Topics	Exam
1		Seminar 1. Information about the subject. Goals and objectives of the subject. Language and speech. Information about the language. Azerbaijani language. Decisions, decrees and laws on the state language of Azerbaijan Seminar 2.Speech culture and the art of oratory. The relationship of the art of oratory with other sciences	
2		Seminar 3.Forms of speech. Written speech and oral speech. Differences between written speech and oral speech. Features of oral speech. Improving oral speech skills	
3		Seminar 4.Communication. Business communication culture Seminar 5. Discussion and listening culture. Ethical issues of speech. Speech etiquette	
4		Seminar 6. Expressive actions that complement oral speech. Body language. Mimicry, gesture	

5		Seminar 7. Literary language. Norms of literary language. Phonetic norm. Observance of orthographic norms in academic and business communication. Abbreviations. Punctuation marks Seminar 8. Observance of orthoepic norms in academic and business communication. Expressiveness of speech. Stress, intonation	
6		Seminar 9. Lexical norm. Expectation of lexical norm in academic and business communication. Use of terms, synonyms, idioms, etc.	
7		Seminar 10. Grammatical norms. Observing grammatical norms in academic and business communication. Inversion. Using descriptive and expressive language tools in academic speech (ellipsis, rhetorical questions, exclamation, etc.) Seminar 11. Auxiliary parts of speech, their stylistic possibilities in speech	
8		Seminar 12. Types of speech: dialogical speech, monological speech, polylogical speech	
9		Seminar 13. Basic requirements for cultural speech Seminar 14. Style and stylistics. Functional styles of the Azerbaijani language	
10		Seminar 15. Scientific style. Rules for written and oral presentation of lectures, scientific papers, essays, scientific reports, summaries, etc.	
11		Seminar 16. Journalistic style. Preparation of academic and business articles in the journalistic style Seminar 17. Official-business style: business correspondence, rules for writing business documents	
12		Seminar 18. Preparation of business advertisements and billboards	
13		Seminar 19. Epistolary style: rules of formal and electronic correspondence. Business correspondence Seminar 20. Areas of Oratory	
14		Seminar 21. Academic oratory. Business rhetoric. Correct construction of business and academic speech	
15		Seminar 22. Procedure and content of CV writing. Questionnaires and surveys. Rules for preparing project questionnaires Seminar 23. Business meetings. Organization of business meetings. Participation in business meetings	

Recommended Sources

TEXTBOOK(S)

1. Khalilov Buludkhan. Business and Academic Communication in Azerbaijani. Baku, 2021
2. Shiriyev Fikret. Speech culture and communication of the Azerbaijani language. Baku, 2021
3. Babayev Adil. Azerbaijani language and speech culture. Baku, 2011
4. Mammadli N. Business and academic communication in Azerbaijani. Baku, 2021
5. Abdullayev Nadir. Fundamentals of speech culture. Baku, 2013
6. Fataliyeva V. Communication in the mother tongue. Baku, 2021
7. Bayramov R. Trust your word. Baku, 2016
8. Novarro Joe, Karlins Marvin. Body Language. Baku, 2015
9. Gurbanov AM Modern Azerbaijani literary language. Baku, 2003
10. Demirchizade A. Modern Azerbaijani language, part I. Phonetics, orthoepy, orthography. Baku, 2007
11. Jafarov S. Modern Azerbaijani language. Part II. Lexicon. Baku, 2007
12. Huseynzade M. Modern Azerbaijani language. Part III. Morphology. Baku, 2007
13. Abdullayev A., Seyidov Y., Hasanov A. Modern Azerbaijani language. Part IV. Syntax. Baku, 2007
14. G. Mustafayeva. Stylistics of the Azerbaijani language. Baku, 2010
15. Suleyman Huseynov, Elvira Garajayeva. Azerbaijani language and speech culture (textbook), Baku 2016
16. Abdulhasanli T.A., Zulfugarli (Huseynova) SR, Rzai AR Azerbaijani language and speech culture, Baku, 2014
17. Dale Carnegie. How to Win Friends and Influence People. Baku, 2007
18. Balakishiyev Sh., Namazov I. Practical writing examples. Baku, 2006

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload	
Total Workload	**120**
Total Workload/30(h)	**120/30**
ECTS Credits of the Course	**4**

Computer Engineering bachelor program, Department of "Philosophy"

Course Unit Title	Philosophy
Course Unit Code	ÜFS-B04
Type of Course Unit	Elective
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	-
Year of Study	2
Semester when the course unit is delivered	3
Course Coordinator	Gunel Mustafayeva
Name of Lecturer(s)	Gunel Mustafayeva
Name of Assistant(s)	-
Delivery Method	Face to Face
Language of Instruction	English, Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-

Course description:
Philosophy is a scientific worldview about nature, society, and man. Based on scientific knowledge, philosophy forms a generalized worldview about nature, society, and man in man and helps to provide a logical analysis of existence.

Course Objectives:
By providing students with spiritual knowledge about nature, society, and humanity, it aims to form a scientific and philosophical worldview in them, and to form logical thinking so that they can understand and analyze the world.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	To form modern approaches to the study of natural and social phenomena, the ability to collect and analyze empirical data, the rules for compiling scientific work, and the ability to summarize and analyze research results.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	2
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	2
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	2
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	2
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the	5

	impact of engineering decisions in various fields	
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1. Introduction to the course. The subject of philosophy and the main areas of philosophy	
2		Seminar 1. Basic philosophical concepts: being, human personality (part I)	
3		Lecture 2. Basic philosophical concepts: being, human personality (part II)	
4		Seminar 2. Approaches to the existence of “soul, mind” in philosophy	
5		Lecture 3. The problem of "free will" in philosophy	
6		Seminar 3. Communication Theories. Logical Fallacies in Argumentation (Part I)	
7		Lecture 4. Communication Theories. Logical Fallacies in Argumentation (Part II)	
8		Seminar 4. Political Philosophy (Introduction): discussion of key concepts	
9		Lecture 5. Economics and Philosophy	
10		Seminar 5. Philosophy and the Concept of Justice	
11		Lecture 6. Philosophy and the Concept of Justice	
12		Seminar 6. Consciousness, brain and computers (artificial intelligence)	
13		Lecture 7. Philosophy and the meaning of life: philosophical practices in our daily lives	
14		Seminar 7. Philosophy and environmental problems	
15		Seminar 8. Time and Space in Philosophy	

Recommended Sources

TEXTBOOK(S)

1) Arendt Hannah, "Human Condition", The University of Chicago Press, Chicago & London, 2d edition, 1998.
2) Arendt Hannah, "The origins of totalitarianism", A Harvest Book Harcourt Brace & Company, San Diego NY London, 1979.
3) Becker Gary S., "Human Capital: A THEORETICAL AND EMPIRICAL ANALYSIS, WITH SPECIAL REFERENCE TO EDUCATION", The University of Chicago Press Ltd., London, 1993.

4) Aristotle, Politics.
5) Beebee, Helen, Free Will: An Introduction, Palgrave, 2013.
6) Cassin Barbara, "Dictionary of Untranslatables: A Philosophical Lexicon", Princeton University Press 2014.
7) Craig Edward, "Philosophy: A very short Introduction", Oxford University Press Inc., New York 2002
8) Eco Umberto, "Eternal Fascism: Fourteen Ways of Looking at a Blackshirt" Writing in New York Review of Books, 22 June 1995, pp. 12-15.
9) Esping-Andersen Gosta, "The three worlds of welfare capitalism", Princeton University Press, Princeton New Jersey, 1990.
10) Fresco Jacque, "The best money can't buy: Beyond Politics, Poverty and War", Global Cyber Visions, 2002.
11) Fullerton George Stuart, "An Introduction to Philosophy", The MacMillan Company, London: Macmillan & Co., Ltd 1915.
12) Habermas Jurgen, "The concept of human dignity and the realistic utopia of human rights", Journal Compilation Metaphilosophy LLC and Blackwell Publishing Ltd., Vol. 41 #4, July 2010.
13) Hayek FA, "The Road to Serfdom", University of Chicago Press, 1944.
14) Thomas Hobbes, "Leviathan".
15) David Hume, "Treatise of Human Nature" (Book I, Section VI "Of Personal Identity"), ed. 1896, Oxford.
16) Krugman Paul, Venables Anthony J., "Globalization and Inequality of Nations", The Quarterly Journal of Economics, Vol. 110, No. 4, November, 1995.
17) Kurzweil Ray, "The Singularity is Near: when humans transcend biology", Penguin Books Ltd., London, 2005.
18) John Locke, "An Essay Concerning Human Understanding" (Chapter XXVII "Of Identity and Diversity"), 2nd Edition.
19) John Locke, "Second Treatise of Government".
20)Ludwig von Mises,Bettina Bien Greaves(Editor), "Human Action: A treatise on Economics", Liberty Fund Inc., 2010.
21) Machiavelli, "The Prince".
22) Marx Karl "Capital, A new abridgement", edited by David McLellan, Oxford University Press Inc., NY, 2008.
23) McGinn Colin, "Consciousness and Its objects", Clarendon Press, Oxford, 2004.
24) McTaggart J. Ellis, "The Unreality of Time", Mind, Volume XVII, Issue 4, 1 January 1908, Pages 457–474.
25) Perry John, "Personal Identity", University of California Press, 1975.
26) Piketty Thomas, "Capital in the twenty-first century", President and Fellows of Harvard College, 2014.
27) Plato, "Republic".
28) Plato, "Trial and Death of Socrates".
29) Rousseau Jean-Jacques, Political Writings.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria Final grades are determined according to the Academic Regulations of WCU	
Course Policies • Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations	
ECTS allocated based on Student Workload	
Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Philosophy"

Course Unit Title	Introduction to Multiculturalism
Course Unit Code	ÜFS-B04
Type of Course Unit	Elective
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	2
Semester when the course unit is delivered	3
Course Coordinator	Elvin Khudaverdiyev Elshan

Name of Lecturer(s)	Elvin Khudaverdiyev Elshan
Name of Assistant(s)	-
Delivery Method	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

Introduction to Multiculturalism is a course that explores the coexistence and interaction of different cultures, ethnic groups, and social identities. It introduces students to the values, customs, and worldviews of different cultures, while also exploring the social, political, and economic aspects of multiculturalism.

Course Objectives:

The aim of the course Introduction to Multiculturalism is to understand the interrelationships of different cultures and ethnic groups, to appreciate the value of cultural diversity, and to promote social harmony. This course teaches students the principles of multiculturalism, intercultural communication, and integration processes, as well as discussing issues of social justice, equality, and human rights. As a result, students acquire the knowledge and skills that will contribute to the development of positive relations between different cultures.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	The outcomes of the course Introduction to Multiculturalism include understanding cultures and strengthening communication skills.	1, 2
2	Increasing empathy and respect, developing tolerance, and improving social knowledge.	1, 2
3	To promote integration and social harmony.	1, 2
4	It also involves developing critical thinking skills.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	2
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3

3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	5
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	2
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	2
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	2
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	5
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1. The subject and importance of Introduction to Multiculturalism	
2		Seminar 1. The subject and importance of Introduction to Multiculturalism	
3		Lecture 2. Religious diversity. The essence of religion and its forms of manifestation	
4		Seminar 2. Religious diversity. The essence of religion and its forms of manifestation	
5		Lecture 3. World religions	
6		Seminar 3. World religions	
7		4. National Religions	
8		Seminar 4. National Religions	

9		Lecture 5. Ethnic diversity and the national idea	
10		Seminar 5. Ethnic diversity and the national idea	
11		Lecture 6. Multiculturalism as an effective policy model for regulating ethnic-cultural diversity	
12		Seminar 6. Multiculturalism as an effective policy model for regulating ethnic-cultural diversity	
13		Lecture 7. Multiculturalism in Azerbaijan in modern times	
14		Seminar 7. Multiculturalism in Azerbaijan in the modern era	
15		Lecture 8. Multiculturalism in Azerbaijan in modern times	

Recommended Sources

TEXTBOOK(S)

1. Guliyev, R. (2015). Fundamentals of Multiculturalism.
2. Khudaverdiyev Elvin - Azerbaijan's multiculturalism policy (2023)
3. Mammadov, A. (2018). Multiculturalism in Azerbaijani society.
4. Aliyeva, S. (2020). Cultural diversity and social harmony.
5. Kymlicka, W. (1995). Multicultural Citizenship: A Liberal Theory of Minority Rights.
6. Taylor, J. (1992). Multiculturalism and the Politics of Recognition.
7. Parekh, B. (2000). Rethinking Multiculturalism: Cultural Diversity and Political Theory.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload	
Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Philosophy"

Course Unit Title	Sociology
Course Unit Code	ÜFS-B04
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	6
Course Coordinator	Gasimov Azer Ali oglu
Name of Lecturer(s)	Gasimov Azer Ali oglu
Name of Assistant(s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-
Course description:	

To teach students the basic concepts, theoretical orientations, and research methods of sociology. Explain the functions of social institutions (family, education, religion, economy, and politics) and their role in society. To gain an understanding of topics such as social groups, stratification, and social mobility. To teach how to analyze social processes and changes with a scientific approach. To develop the ability to investigate the social problems of society and provide solutions to them. To strengthen analytical and critical thinking skills, and to instill the ability to analyze empirical research.

Course Objectives:

Sociology is a field of study that encompasses the study of social structure, social institutions, social change, and human behavior in a social context. This subject teaches students to analyze social phenomena with a scientific approach and gain a deeper understanding of the events that occur in society.

Sociology studies the behavior of people in the social world, the formation of social relationships, and the social structures of society. The main goal of the subject is to explain to students the role of social institutions (family, religion, education, economics, and politics) in the formation of society, to help them understand how social processes occur, and the impact of social changes on individuals and groups.

Through this course, students learn about social dynamics, social norms, and social control mechanisms in society, as well as gain knowledge about current topics such as social inequality, social stratification, urbanization, gender, and ethnic issues. In addition, students learn sociological research methods and acquire the skills to analyze social problems on a scientific basis.

In addition to developing critical and analytical thinking skills, sociology provides students with the theoretical and practical knowledge necessary to work in various areas of society - social policy, social services, business, media and non-governmental organizations. During the course, students will analyze social problems, become familiar with empirical research methods and develop skills that can contribute to the social development of society.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	They will develop the ability to analyze social phenomena and processes with a scientific approach.	1, 2
2	They will be able to conduct empirical research using social research methods (surveys, interviews, observation, etc.).	1, 2
3	They will approach social problems critically and develop analytical thinking skills to solve them.	1, 2
4	They will analyze the relationships between social groups and individuals and evaluate the functioning of social institutions.	1, 2
5	They will be able to apply the theoretical knowledge they have gained in social policy, business, media, and other fields.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	2
2	ability to apply ICT (Information and Communication Technology) capabilities in	3

	various fields of activity, using knowledge in related sciences, language skills and information technology	
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	5
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	2
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	2
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	2
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	5
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1. Sociology as a science	
2		Seminar 1	
3		Lecture 2. Society as a complex social phenomenon	
4		Seminar 2	
5		Lecture 3. Personality as a social system	
6		Seminar 3	
7		Lecture 4. The concept of social structure	
8		Seminar 4	
9		Lecture 5. Sociology of social ethnic relations	

10		Seminar 5	
11		Lecture 6. Social territorial associations	
12		Seminar 6	
13		Lecture 7. Religion and sociology	
14		Seminar 7	
15		Education and sociology Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. Giddens, A. (2009). Sociology. Polity Press.
2. Macionis, JJ (2018). Sociology. Pearson.
3. Ritzer, G. (2021). Sociological Theory. McGraw-Hill.
4. Haralambos, M., & Holborn, M. (2013). Sociology: Themes and Perspectives. Collins.
5. Berger, PL, & Luckmann, T. (1966). The Social Construction of Reality: A Treatise in the Sociology of Knowledge. Penguin Books.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**90**

Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Philosophy"

Course Unit Title	Constitution of the Republic of Azerbaijan and Fundamentals of Law
Course Unit Code	ÜFS-B04
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	2
Semester when the course unit is delivered	3
Course Coordinator	Arzu Hajiyeva Bahruz
Name of Lecturer(s)	Arzu Hajiyeva Bahruz
Name of Assistant(s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-
Course description: The course covers the concept, structure, stages of development of the constitution, the concept and content of human and civil rights and freedoms, as well as the concept of law, and the stages of formation of the legal system in Azerbaijan.	

Course Objectives: The main goal is to teach students the basics of the Constitution, including the basics of law. Acquiring and mastering the necessary knowledge is one of the important conditions.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	To study in depth the Constitution of the Republic of Azerbaijan and to gain excellent knowledge about human and civil rights and freedoms.	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		
Course's Contribution to the Program		
		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	2
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	2
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	2
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	2
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	5

10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1. Concept, structure and stages of development of the Constitution of the Republic of Azerbaijan	
2		Seminar 1	
3		Lecture 2. Constitutional and legal status of man and citizen in the Republic of Azerbaijan	
4		Seminar 2	
5		Lecture 3. State power and local self-government of the Republic of Azerbaijan	
6		Seminar 3	
7		Lecture 4. The concept, essence and sources of the legal system of the Republic of Azerbaijan	
8		Seminar 4	
9		Lecture 5. Legal system and areas of law	
10		Seminar 5	
11		Lecture 6. Legal norms and legal relations	
12		Seminar 6	
13		Lecture 7. Legal facts, violations of law and legal liability	
14		Seminar 7	
15		Lecture 8. Areas of law: fundamentals of constitutional, administrative and criminal law	

Recommended Sources TEXTBOOK(S)

1. Constitution of the Republic of Azerbaijan
2. SS Allahverdiyev. Fundamentals of the Constitution and Law of the Republic of Azerbaijan. Textbook. Baku, 2012
3. VV Lazarev. General law and theory of state. Baku, 2007
4. SS Allahverdiyev, Fundamentals of the Constitution and Law of the Republic of Azerbaijan. Textbook. Baku, 2010
5. Frederick Bastiat, Law, Baku, 2007
6. Constitutional Law of the Republic of Azerbaijan "On Normative Legal Acts", Baku, 2011

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Philosophy"

Course Unit Title	Logic
Course Unit Code	ÜFS-B04
Type of Course Unit	Elective
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	2
Semester when the course unit is delivered	3
Course Coordinator	Gunel Mustafayeva Nureddinovna
Name of Lecturer(s)	Gunel Mustafayeva Nureddinovna
Name of Assistant(s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
The course offers students to approach logic as a branch of philosophy through brain work, language, deductive and inductive logic, The Art of judgment, and classroom discussions. The main attention is paid to the study of the mechanism of argumentation and expression of the idea. Particular attention is paid to logical errors. The problems and challenges of modern times will also be analyzed and discussed.

Course Objectives:
Students should leave this course by understanding the basic concepts of logic; to demonstrate an understanding of the central questions of logic as a field of philosophy, to become familiar with the art of judgment and to create an idea of the main challenges of modern times.

Learning Outcomes

At the end of the course the student will be able to	Assessment

1	the study of the content of the subjects and problems of the discipline, its basic concepts and their use in other philosophical and humanitarian disciplines	1, 2
2	the student should be able to freely analyze the ideas contained in philosophical schools and compare them	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		
Course's Contribution to the Program		
		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	3
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	2
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	3
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	2
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		
Course Contents		

Week	Chapter	Topics	Exam
1		Lesson 1. Introduction to Course. Logic as an area of philosophy. The purpose of the course. The work of the brain	
2		Seminar 1. Introduction to Course. Logic as an area of philosophy. The purpose of the course. The work of the brain	
3		Lesson 2. Language and Reasoning: classification, definitions, propositions	
4		Seminar 2. Language and Reasoning: classification, definitions, propositions	
5		Lesson 3. Formal and Informal Logic (I)	
6		Seminar 3. Formal and Informal Logic (I)	
7		Lesson 4. Formal and Informal Logic (II)	
8		Seminar 4. Formal and Informal Logic (II)	
9		Lesson 5. Argumentation theory and philosophy. Logical fallacies. The art of asking questions (I)	
10		Seminar 5. Argumentation theory and philosophy. Logical fallacies. The art of asking questions (I)	
11		Lesson 6. Argumentation theory and philosophy. Logical fallacies. The art of asking questions (II)	
12		Seminar 6. Argumentation theory and philosophy. Logical fallacies. The art of asking questions (II)	
13		Lesson 7. The art of asking questions	
14		Seminar 7. The art of asking questions	
15		Seminar 8. Long-term thinking, planning	

Recommended Sources

TEXTBOOK(S)

1. Logic (I. Israfilov) B., 2005;
2. Logic (Hasan Küçük) Istanbul 1990;
3. Logic. (M. Ivin) Moscow, 2003;
4. Novikov O.A., Uvarov S.A. Commercial logic. - St. Petersburg, 1995.
5. Bocharov V.A., Markin V.I. Fundamentals of logic. - M.,1999.
6. Getmanova A.D. Logic. - M., 1995.
6. Grigoryev B.V. Classical logic. - M., 1996.
7. Ивлев Ю.В. Logic. - M., 1997.
8. Ruzavin G.I. Logic and argumentation. - M., 1997.
9. Kirillov V.I. Logic exercises. - M., 1999.
10. Svetlov V.A. Practical logic. - St. Petersburg, 1997.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Philosophy"

Course Unit Title	Ethics and Aesthetics
Course Unit Code	ÜFS-B04
Type of Course Unit	Elective
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	2
Semester when the course unit is delivered	3
Course Coordinator	Gunel Mustafayeva Nureddinovna
Name of Lecturer(s)	Gunel Mustafayeva Nureddinovna
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
The subject "Ethics and Aesthetics" examines the emergence and evolution of ethical teachings throughout history; it allows students to gain knowledge about the main ethical theories that have existed in human history, to form a unified view of the study of ethics in the system of social and philosophical sciences, and to understand the process of interaction between morality and society.

Course Objectives:
Familiarization with the technology of organizing research, its types, stages, methods and techniques; orientation of the student to conduct research in the experimental process by putting forward and realizing his own hypotheses and concepts, as well as understanding the possibilities of testing them alone or together with his group mates; formation of the ability to review scientific literature for the initial study of the problem

Learning Outcomes

At the end of the course the student will be able to	Assessment

1	Forms the ability to rationally approach the history of ethical thought; creates a complete picture of the essence of morality and classifies its main functions; emphasizes the importance of maintaining objectivity in the study of the history of ethical thought; applies the acquired theoretical knowledge in professional and everyday activities.	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		
Course's Contribution to the Program		
		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	2
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	2
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	2
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	2
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	5
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		
Course Contents		

Week	Chapter	Topics	Exam
1		Lecture 1. Ethics in the system of philosophical knowledge	
2		Seminar 1. Ethics in the system of philosophical knowledge	
3		Lecture 2. The formation of ethical thought. The main stages in the development of ethical teachings	
4		Seminar 2. The formation of ethical thought. The main stages in the development of ethical teachings	
5		Lecture 3. Ethical ideas in the history of public opinion in Azerbaijan	
6		Seminar 3. Ethical ideas in the history of public opinion in Azerbaijan	
7		Lecture 4. The essence and functions of morality	
8		Seminar 4. The essence and functions of morality	
9		Lecture 5. Main categories of ethics	
10		Seminar 5. Main categories of ethics	
11		Lecture 6. Moral sense and moral practice	
12		Seminar 6. Moral sense and moral practice	
13		Lecture 7. Applied ethics and its scope	
14		Seminar 7. Applied ethics and its scope	
15		Lecture 8. Ethical principles in professional activity	

Recommended Sources

TEXTBOOK(S)

1. Qizilgul Abbasova. Ethics: history, theory and practice (textbook). Baku, 2016
2. Sevinj Shahhüseynova, Ethics, Baku, 2009
3. Aristotle, Politics. Great Ethics, Baku, 2006
4. Nasiruddin Tusi, Moral Nasiri, Baku, 1989

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	

Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload	
Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Information Technology (Specialization)
Course Unit Code	ÜFS-B05
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	-

Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Hajiyeva Rena Javadkhan
Name of Lecturer(s)	Hajiyeva Rena Javadkhan
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

To form appropriate knowledge, skills and habits in students, and to ensure their preparation for working with computers.

Course Objectives:
Ensuring the scientific and methodological preparation of future specialists (goals and content of Informatics training, forms of organization of training, methods and tools, modern training technologies), forming in them the relevant knowledge, skills and habits for implementing training, familiarizing them with the accumulated experience in teaching Informatics, and forming the ability to think logically.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about the goals and objectives of computer science as a science, scientific research methods, and its relationship with other sciences	1, 2
2	Formation of ideas about the forms of organizing computer science training	1, 2
3	Formation of ideas about the means of teaching informatics	1, 2
4	Formation of ideas about the principles and teaching methods of computer science training	1, 2
5	Formation of ideas about the goals and objectives of Informatics training for undergraduate students	1, 2
6	Performing practical tasks used in the training of Informatics course for undergraduate students	1, 2
7	Monitoring and investigating the level of implementation of practical tasks;	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL

1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	5
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	4
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	4

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1. Application of information technologies in the agricultural sector and the tasks they pose. Development stages of information technologies. Concept of information, properties, forms, units of measurement	
2		Seminar 1. Computer architecture. Assembling and disassembling a computer. Visual introduction to devices	
3		Lecture 2. The main components of information technologies. HardWare - technical support. SoftWare - software. BrainWare - instrumental support. Main and peripheral devices of computers	

4		Seminar 2. Practical ways to use the basic capabilities of the Word text editor. Formatting texts. Creating tables	
5		Lecture 3. Computer software. Classification of operating systems. Windows operating system, basic parameters. Files and folders. Types of menus and windows of the Windows operating system	
6		Seminar 3. Using the graphic capabilities of Word. Drawing diagrams	
7		Lecture 4. Word processors. Word text editor and its main capabilities. Graphic capabilities of Word text editor. Mathematical software packages	
8		Lecture 5. Windows operating system menus, windows. Windows Aero interface. Files and folders. Hot keys	
9		Seminar 4. Using and practicing the standard hotkeys of the Windows operating system	
10		Seminar 5. Computer graphics. Color models. Basic capabilities of the Power Point presentation program. Application of the basic capabilities of the Power Point presentation program. Preparation of a presentation describing the life and work of famous people	
11		Lecture 6. MS Excel spreadsheet. Cell, block, page. Creating charts. Filter and sort operations. Classification of functions in Excel. Functions of mathematical, statistical, financial, text, logical and other categories	
12		Seminar 6. Practical application of the basic capabilities of the MS Excel spreadsheet	
13		Lecture 7. Using database management systems in the agricultural sector. Purpose, main capabilities, objects, data types of Access DBMS	
14		Seminar 7. Classification, architecture, types, topology of computer networks. Structure of the Internet network	
15		Lecture 8. Classification, architecture, types, topology of computer networks. Structure of the Internet network	

Recommended Sources

TEXTBOOK(S)

1. Hajiyeva RC Informatics. Collection of lectures, Polygraphic and Publishing Center of the State University of Baku, Baku, 2020, 180 p.
2. Shirokova A. I., Pyshniak M. Informatics. Разработка программ на языке программирования Piton, M., 2020, 144 p.
3. Alizade MN, Orujova TV, Hasanova N.A. Information security. Baku, “MSV Publishing”, 2018, 388 p.
4. Informatics for economists. Учебник для бачалериата и специалитета / ed. Poliakov V. P. M.: Yurayt, 2019. 524 c.
5. Lyakhovich V.F., Molodtsov V.A., Ryzhikova N.B. Fundamentals of computer science. — M.: KnoRus, 2016. — 348 c.
6. Makarova N. B. Informatics: Textbook for universities. Publisher: Peter, 2013, 576 c.

7. Informatics and information technologies / ed. Yu.D. Romanova. — M.: Eksmo, 2011. — 544 p.
8. Prosvetov G.I. Data analysis using Excel. Tasks and solutions. — M.: Alfa-Press, 2015. — 160 c
9. Nabiullina S.N. Informatics and ICT. Course lecture. M.: Lan, 2019. 72 p.
10. Gasumova S. E. Social informatics. Textbook and practice for universities. M.: Yurayt, 2019. 284 c.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Information Management
Course Unit Code	ÜFS-B05

Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Mustafayeva Sabina Fazil
Name of Lecturer(s)	Mustafayeva Sabina Fazil
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
The subject "Information Management" covers the topics of ICT, its application areas, database organization, and information management. Among these topics, "Database Management System", "Database Organization in MS Access Environment", etc. can be mentioned.

Course Objectives:
The purpose of the subject "Information Management" is to form a worldview, relevant knowledge and skills about information processes, ICT, its characteristics, application, information management, and database creation.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about information processes	1, 2
2	Formation of ideas about information technologies and their application areas	1, 2
3	Formation of perceptions about information management	1, 2
4	Formation of ideas about database management system and database creation	1, 2

5	Formation of ideas about spreadsheet organization technologies	1, 2
6	Formation of ideas about computer networks and the ability to use them	1, 2
7	Formation of the ability to use information technologies that are most commonly used in education and specialization	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		
Course's Contribution to the Program		
		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	5
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	4
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		
Course Contents		

Week	Chapter	Topics	Exam
1		Lecture 1. Information theory (encoding)	
2		Seminar 1. Information theory (coding)	
3		Lecture 2. Biometrics	
4		Seminar 2. Biometrics	
5		Lecture 3. Database	
6		Seminar 3. Database	
7		Lecture 4. Internet Search Engines	
8		Seminar 4. Internet Search Engines	
9		Lecture 5. E-Commerce Management	
10		Seminar 5. E-Commerce Management	
11		Lecture 6. Artificial intelligence. Expert systems	
12		Seminar 6. Artificial intelligence. Expert systems	
13		Lecture 7. Big data	
14		Seminar 7. Big data	
15		Seminar 8. Multimodal and natural human-computer interaction	

Recommended Sources

TEXTBOOK(S)

1. Published on Horizon 2020 (https://ec.europa.eu/programmes/horizon2020)
2. Work Program 2018-2020 Information and Communication Technologies-Horizon
3. https://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-leitict_en.pdf - page=3
4. https://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/main/h2020-wp1415-leitict_en.pdf - page=3
5. http://www.researchgate.net/publication/3 17012641

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	

Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload	
Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Political Science"

Course Unit Title	Political Science
Course Unit Code	ÜFS-B05
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	4
Semester when the course unit is delivered	7

Course Coordinator	Rahimov Elkhan Rahim o
Name of Lecturer(s)	Rahimov Elkhan Rahim o
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

"Political science" is the science of politics, political processes and institutions, and political power. The main task of political science, which reflects the diversity and diversity of the political life of society, is to provide objective, scientifically based information about political phenomena and processes and to use this information for the benefit of social development. The course consists of theoretical and seminar (practical) lessons.

Course Objectives:

The teaching of this subject has the following objectives:

- The main goal of the course is to help students develop a general understanding of modern political knowledge;
- The main teaching tools are lectures, Seminars, demonstration of presentations, class discussions, expert reports, team projects, role-playing games, analysis and criticism of various political works, including articles taken from magazines and websites.

Before each lesson, the student must read the assigned texts and all other assigned reading materials.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	A successful student will have fully mastered the core political concepts by the end of the course.	1, 2
2	The ability to analyze empirical and normative approaches will be developed.	1, 2
3	Familiarity with various political teachings will help them develop a broad and systematic political worldview.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	2
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and	3

	information technology	
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	5
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	2
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	2
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	2
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	5
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1. Knowledge about politics. Stages of development of political science	
2		Seminar 1. Knowledge about politics. Development of political science stages	
3		Lecture 2. The Concept of the State	
4		Seminar 2. The Concept of the State	
5		Lecture 3. Political ideologies. Political power	
6		Seminar 3. Political ideologies. Political power	
7		Lecture 4. Democracy	
8		Seminar 4. Democracy	

9		Lecture 5. Foreign policy	
10		Seminar 5. Foreign policy	
11		Lecture 6. International relations	
12		Seminar 6. International relations	
13		Lecture 7. Global governance	
14		Seminar 7. Global governance	
15		Lecture 8. Game Theory. Political Conflict and Security Seminar 8. Game Theory. Political Conflict and Security	

Recommended Sources

TEXTBOOK(S)

1. Efendiyev, M. (1998) Problems of Political Science. Baku
2. Huseynov, R. (2017) Political Science. Baku
3. Shiraliyev H., Ahmadov A. (1997) Political Science. Baku
4. Shiraliyev H. (1998) Political Science. Baku
5. Teymurlu, M. (2014) Political Science. Baku
6. Azerbaijan State University of Economics (2004) Political Science (Textbook). Baku
7. Vasilik M. A. (ed.) (2001). Political science. Moscow: Gardariki.
8. Pugachev V.P., Solov'ev, A.I. (1998). Introduction to political science. Moscow: Aspect Press.
9. Heywood, A (2013). Politics. 4th ed. New York: Palgrave Macmillan.
10. Ranney, Austin (1996). Governing: An Introduction to Political Science. New Jersey: Prentice-Hall.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies • Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations	
ECTS allocated based on Student Workload	
Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Marketing and Management "

Course Unit Title	Fundamentals of Entrepreneurship and Introduction to Business
Course Unit Code	ÜFS-B05
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	6
Course Coordinator	Alberto Levy
Name of Lecturer(s)	Alberto Levy

Name of Assistant(s)	-
Mode of Delivery	Face to face
Language of Instruction	English, Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-

Course description:

This course will provide students with the key foundations of the entrepreneurial process from a macro and micro perspective.

The course will be based on three main pillars: 1) creativity, 2) logical reasoning and 3) problem sensitivity. These three skills are at the core of any entrepreneur's thinking that takes place amid the contextual reality of today's extreme uncertainty.

These skills will also be particularly relevant for future employment and businesses, as organizations increasingly need to be agile and take an experimental approach to build valuable innovations and business models that positively affect society and meet the needs of the market.

Course Objectives:

Understand the entrepreneurial process, its impact, and significance within the macro and micro context of individuals, economies and societies.

Understand and apply the entrepreneurial mindset to discover business ideas and assess their viability

Analyze the key components of the entrepreneurial process, namely; opportunity discovery, business modeling, procurement resources and team formation.

Apply your analysis of the entrepreneurial process to an idea you identify as a team early in the course.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Understand and explain basic concepts of entrepreneurship and business operations, including types of businesses and business models.	1, 2
2	Develop and evaluate a business idea, demonstrating understanding of opportunity recognition and feasibility analysis.	1, 2
3	Prepare key components of a business plan, such as marketing, financial, and operational strategies.	1, 2
4	Identify and compare various sources of business financing, including traditional and modern funding methods.	1, 2
5	Demonstrate communication, teamwork, and problem-solving skills in entrepreneurial and business decision-making contexts.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL

1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	3
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	5
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	3
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	3
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	3
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	3
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	5
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1. Introduction To Entrepreneurship	
2		Lecture 2. Entrepreneurial & Start Up Culture	
3		Lecture 3. Startup Thinking	
4		Lecture 4. Problem Definition	
5		Lecture 5. Empathy and Observation	
6		Lecture 6. Innovation and Creativity	

7		Lecture 7. Ideation	
8		Group Project 1: Startup Concept	
9		Lecture 8. Product Prototyping & Testing	
10		Lecture 9. Understanding Business Models	
11		Lecture 10. Go-To-Market and Marketing Strategies	
12		Lecture 11. Financing Entrepreneurial Ventures	
13		Lecture 12. Pitching to Investors	
14		Lecture 13. How To Turn Your Idea into a Real Business	
15		Group Project 2 - Final Pitch Deck	

Recommended

Sources TEXTBOOK(S)

1. Hisrich, RD, Peters, MP, & Shepherd, DA Entrepreneurship (12th Edition). McGraw-Hill Education.
2. Scarborough, NM Essentials of Entrepreneurship and Small Business Management (9th Edition). Pearson.
3. Barringer, BR & Ireland, RD Entrepreneurship: Successfully Launching New Ventures (6th Edition). Pearson.
4. Boone, L. & Kurtz, D. Contemporary Business (18th Edition). Wiley.
5. Zimmerer, TW & Scarborough, NM Effective Small Business Management: An Entrepreneurial Approach. Pearson.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies • Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations	
ECTS allocated based on Student Workload	
Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Mechanics and Mathematics"

Course Unit Title	Linear Algebra and Analytic Geometry
Course Unit Code	İF-BO1
Type of Course Unit	Compulsory
Level of Course Unit	1st year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	1
Semester when the course unit is delivered	1
Course Coordinator	Taghiyev Rauf Mursal
Name of Lecturer(s)	Taghiyev Rauf Mursal
Name of Assistant(s)	-

Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

The teaching of the subject "Linear Algebra and Analytical Geometry" is intended to teach students the basic concepts of the subject, to master basic knowledge about the matrix calculus of mathematics, methods for solving systems of linear equations, vector calculus, finding and applying analytical expressions for straight lines and curves in the plane and space. These, in turn, play an important role in teaching other subjects. The course consists of theoretical and seminar lessons. Here, the application of all theorems and properties is reflected in practical exercises.

Course Objectives:

Elements of "linear algebra and analytical geometry" are applied in computing, programming, and various fields of economics. Therefore, specialists in the given areas must master the basics of this subject.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Teaching higher mathematics together with other fundamental sciences allows for the development of students' intellectual potential and the formation of creative personalities who successfully function in the modern system of relations.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	4
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	3
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4

6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	3
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1. The concept of a matrix. Operations on matrices. Determinants of two and three orders. Basic properties of the determinant. Minor and algebraic complements	
2		Seminar 1	
3		Lecture 2. Inverse matrix. Elementary transformations on a matrix. Rank of a matrix. n-order determinants	
4		Seminar 2	
5		Lecture 3. System of linear equations. Methods for solving a system of linear equations: Cramer's rules, matrix method	
6		Seminar 3	
7		Lecture 4. Gaussian method. System of linear equations in n-unknowns, Kronecker-Capelli theorem	
8		Seminar 4	
9		Lecture 5. The concept of a vector. Scalar, vectorial and mixed products of vectors	
10		Seminar 5	
11		Lecture 6. Equations of a straight line on a plane	
12		Seminar 6	
13		Lecture 7. Equations of a plane and a straight line in space	
14		Seminar 7	

15		Two-order curves and surfaces Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. Howard Anton, Chris Rohres. Elementary linear algebra. 7-th edition, John Wiley& Sons, INC.
2. Demidovich V.P., Kudryavtsev V. A. Short course of advanced mathematics. M.: "Nauka", 2001.
3. Ilyin V. A., Kurkina A. B. Higher mathematics M.: 2005.
4. Ilyin V. A., Pozniak E. G. Linear algebra. M.: "Nauka", 1981.
5. Beklemishev D. B. Course of analytical geometry and linear algebra. M., "High School", 1998.
6. Alexander Akhmerov, Alexander Tyurin "Fundamental Higher Mathematics Linear Algebra and Analytical Geometry PI" Publisher: LAP LAMBERT Academic Publishing 2019. 264 pages

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Mechanics and Mathematics"

Course Unit Title	Calculus
Course Unit Code	İF-BO2
Type of Course Unit	Compulsory
Level of Course Unit	1st year
National Credits	
Number of ECTS Credits Allocated	7
Theoretical (hours/week)	3
Practice (hours/week)	2
Laboratory (hours/week)	
Year of Study	1
Semester when the course unit is delivered	2
Course Coordinator	Habibov Sanan Amirsoltan
Name of Lecturer(s)	Habibov Sanan Amirsoltan
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-
Course description: The mathematical analysis course is taught in the section of Mathematics "Differential and integral calculus of univariate and multivariable functions", and is intended to teach students the basic concepts of the subject and master basic knowledge. These, in turn, play an important role in teaching other subjects. The course consists of theoretical and seminar lessons. Here, the application of all theorems and properties is reflected in practical exercises.	
Course Objectives: Mathematical analysis is applied in all fields of science and technology. Therefore, specialists in the given areas must master the basics of the subject of Mathematical Analysis.	
Learning Outcomes	

At the end of the course the student will be able to		Assessment
1	Teaching mathematical analysis together with other fundamental sciences allows for the development of students' intellectual potential and the formation of creative personalities who successfully function in the modern system of relations.	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		
Course's Contribution to the Program		
		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	4
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	3
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	3
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		
Course Contents		

Week	Chapter	Topics	Exam
1		Lesson 1. Limit of a numerical sequence Lesson 2. Limit and basic properties of numerical sequences **Seminar 1**	
2		Lesson 3. Function and its limit **Seminar 2**	
3		Lesson 4. Indispensability Lesson 5. Derivative **Seminar 3**	
4		Lesson 6. The rule of taking the derivative, derivatives of basic elementary functions **Seminar 4**	
5		Lesson 7. Basic theorems of differential calculus Lesson 8. Application of differential calculus **Seminar 5**	
6		Lesson 9. Investigating a function by extremum **Seminar 6**	
7		Lesson 10. Indefinite integral Lesson 11. Basic properties of the indefinite integral, basic integration methods **Seminar 7**	
8		Lesson 12. Integration of rational fractions. Integration of irrational expressions **Seminar 8**	
9		Lesson 13. Definite integral Lesson 14. Methods of calculating the definite integral **Seminar 9**	
10		Lesson 15. Methods for approximating a definite integral **Seminar 10**	

11		Lesson 16. Improper integrals Lesson 17. Multivariable functions **Seminar 11**	
12		Lesson 18. Gradient of a bivariate function **Seminar 12**	
13		Lesson 19. Extremum of a bivariate function Lesson 20. Necessary and sufficient conditions for the extremum of a bivariate function **Seminar 13**	
14		Lesson 21. Numerical sequences **Seminar 14**	
15		Lesson 22. Functional series Lesson 23. Abel's theorem. Power series of elementary functions **Seminar 15**	

Recommended Sources

TEXTBOOK(S)

1. M. Mardanov, S. Isayeva, R. Aslanov. Higher Mathematics, Baku, 2020.
2. R. Mammadov, “Higher Mathematics Course”, Part I, Baku, “Turan Evi” Publishing House, 2013.
3. R. Mammadov, “Higher Mathematics Course”, Part II, Baku, “Turan Evi” Publishing House, 2016.
4. V.S. Shipachev. "Vysshaya Mathematica", Izd. Higher school, 2010.
5. V.A. Kudryavtsev, B.P. Demidovich "Short course of higher mathematics", M., Nauka, 2001.
6. A.A. Husak, Высшая математика: учебник для студентов узов в 2-х томах, Минск, 2007, т.1
7. V.S. Shipachev. "Zadachnik po vysshey matematike", Izd. Higher school, 2010.
8. V.P. Minorsky. "Collection of problems in advanced mathematics", M.: FIZMATLIT, 2006.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria Final grades are determined according to the Academic Regulations of WCU	
Course Policies • Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations	
ECTS allocated based on Student Workload	
Total Workload	**210**
Total Workload/30(h)	**210/30**
ECTS Credits of the Course	**7**

Computer Engineering bachelor program, Department of "Mechanics and Mathematics"

Course Unit Title	Differential Equations
Course Unit Code	İF-BO3
Type of Course Unit	Compulsory
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	2
Semester when the course unit is delivered	4
Course Coordinator	Dosiyev Adigozel Ahmed
Name of Lecturer(s)	Dosiyev Adigozel Ahmed

Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
The subject "Differential Equations", intended for students studying in the bachelor's degree program in the fields of K and IT, includes basic concepts about differential equations, problems that can be reduced to differential equations, ways to solve equations such as separable, linear, linear homogeneous equations of variables, Bernoulli's equation, second-order homogeneous and linear differential equations, systems of differential equations, as well as general information about differential equations with special derivatives.

Course Objectives:
To instill in students the ability to construct mathematical models of technological processes in order to analyze them based on their rates of change.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	The main goal of teaching differential equations is to develop in future specialists the ability to mathematically model and analyze time-varying processes and to determine appropriate forecasts on this basis.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	4
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	3
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4

6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	3
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1. General information about differential equations. Some problems related to differential equations. General, particular and specific solutions of ordinary differential equations. Cauchy problem	
2		Seminar 1	
3		Lecture 2. Separable and separable differential equations with respect to their variables. Homogeneous linear equations	
4		Seminar 2	
5		Lecture 3. First-order linear differential equations. Bernoulli equation	
6		Seminar 3	
7		Lecture 4. Complete differential equations. Integrating multiplication	
8		Seminar 4	
9		Lecture 5. General concepts about higher-order differential equations. Reducible second-order differential equations	
10		Seminar 5	
11		Lecture 6. Second-order linear differential equations. Second-order linear homogeneous differential equations. Second-order linear homogeneous differential equations with constant coefficients	
12		Seminar 6	
13		Lecture 7. System of ordinary differential equations. Basic concepts. Integration of ordinary systems. System of ordinary differential	

		equations with constant coefficients	
14		Seminar 7	
15		General information about special differential equations. Types of second-order special differential equations Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. Shepley L. Roos. Introduction to ordinary differential equations, 4th edition, JOHN WILEY & SONS, 1989.
2. D.T. Written. Abstracts of lectures on higher mathematics. Moscow, Higher Education, 2009.
3. S.N. Kiyasov. Differential equations. Basic theory. Methods of problem solving. Kazan, 2011.
4. KK Ponomarev. Special course of higher mathematics. Moscow, "High School", 2014.
5. V.P. Minorsky. Collection of tasks on higher mathematics. Moscow, "Nauka", 2009.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Mechanics and Mathematics"

Course Unit Title	Discrete Mathematics
Course Unit Code	İF-BO4
Type of Course Unit	Compulsory
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	2
Semester when the course unit is delivered	4
Course Coordinator	Ibrahimova Sabina
Name of Lecturer(s)	Ibrahimova Sabina
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

As a result of studying the subject "Discrete Mathematics", the student should be able to do the following:

• to know the basic methods of discrete mathematics and be able to apply them in practice;

• must be able to understand and apply computers in practice to implement technologies for solving various problems in discrete mathematics;

• have the skills to solve practical problems in mathematics; It is intended to teach students the basic concepts of the subject and to acquire basic knowledge.

These, in turn, play an important role in teaching other subjects. The course consists of theoretical and

seminar lessons. Here, the application of all theorems and properties is reflected in practical exercises.

Course Objectives:

The goal and main objective of teaching the subject is to provide future specialists with relevant knowledge about the subject of "Discrete Mathematics" and to develop in them the ability to effectively use this knowledge in their work.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	The knowledge acquired will be significantly needed in applying and improving high technologies among specialists with these qualifications.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	4
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	3
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	4
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	3
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3

10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1. Negation actions on concepts of reasoning	
2		Seminar 1	
3		Lecture 2. Basic concepts of set theory Operations on sets	
4		Seminar 2	
5		Lecture 3. About find functions. Logical propositions	
6		Seminar 3	
7		Lecture 4. Truth tables of operations. Operations on logical propositions	
8		Seminar 4	
9		Lecture 5. Operations on graphs. Types of graphs. The concept of radius in a graph. The concept of diameter in a graph	
10		Seminar 5	
11		Lecture 6. Information about the basic elements of combinatorics	
12		Seminar 6	
13		Lecture 7. Examples according to the laws of permutation, arrangement, and combination	
14		Seminar 7	
15		Newton's binomial Seminar 8	

Recommended

Sources TEXTBOOK(S)

1. Farajov RH, Shimiyev HV Discrete Mathematics, Baku University Publishing House, Baku, 1998, 216 p.
2. Kenneth H. Rosen. Discrete Mathematics and Its Applications, 7th edition, McGrawHill, New York, 2007, 1071 p.
3. Aslanova NX, Ahmadova JB, Mammadov K.Sh., Mansimov KB Graph Theory, Baku, 2014, 180 p.
4. Mansimov KB, Ahmadova JB, Aliyeva ST Discrete analysis, Baku University Publishing House, Baku, 2018, 302 p.

5. Yablonsky SV Introduction to Discrete Mathematics, Mir Publishers, Moscow, 1989, 384p
6. Feyziyev FG Some chapters of discrete mathematics, “Education” NPM, Baku, 2008, 242 p.
7. Aliyev AY, Piriverdiyev V.A. Elements of discrete mathematics, Baku, Mutarcim, 2003, 92
8. Akbarov MC Lectures on Algebra, Baku, Nurlar, 2001, 473 p.
9. Sadigov NA Scientific foundations of the elementary course of mathematics, Baku, Maarif, 1991, 352 p.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Mechanics and Mathematics"

Course Unit Title	Probability Theory and Mathematical Statistics
Course Unit Code	İF-BO5
Type of Course Unit	Compulsory
Level of Course Unit	1st year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	1
Semester when the course unit is delivered	2
Course Coordinator	Amiraslanli Fatma Hikmet
Name of Lecturer(s)	Amiraslanli Fatma Hikmet
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
The "mathematical statistics" course, intended for undergraduate students, covers topics such as discrete and continuous random variables and their mathematical expectation, variance and mean squared tendency, initial and central moments, statistical distribution of sampling, frequency and relative frequency, initial and sample collection, evaluation of their numerical characteristics, confidence interval, and so on.

Course Objectives:
The goal of the course is to develop the mathematical thinking of future graduates, to instill in them the ability to conduct mathematical analysis of observations and results, and to make appropriate predictions.

Learning Outcomes

At the end of the course the student will be able to	Assessment

1	Developing students' intellectual potential and increasing their ability to use mathematical methods in their future activities.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	4
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	3
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	3
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	3
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam

1		Lecture 1. Random events and probabilities	
2		Seminar 1	
3		Lecture 2. Basic properties of probability	
4		Seminar 2	
5		Lecture 3. Distribution law of discrete random variables, distribution functions	
6		Seminar 3	
7		Lecture 4. Discontinuous random variables. Numerical characteristics of random variables and their properties	
8		Seminar 4	
9		Lecture 5. Law of large numbers	
10		Seminar 5	
11		Lecture 6. Two-dimensional random variables	
12		Seminar 6	
13		Lecture 7. Elements of mathematical statistics. Regression equations	
14		Seminar 7	
15		Lecture 8. Functional interaction. Correlation coefficient and its calculation. Regression analysis Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. N.N. Bavrin "Theory of probability and mathematical statistics" Higher school, 2005
2. V.E. Gmurman. "Theory of probability and mathematical statistics" Higher school, 2003
3. V.E. Gmurman. "Guide to solving problems in probability theory of mathematical statistics" Higher school, 2004.
4. Robert W. Hogg, Joseph W. McKean, Allen T. Craig Introduction to Mathematical Statistics Eighth Edition. 2019, pp. 762.
5. Thomas J. Faulkenberry Psychological Statistics First published 2022by, New York, NY 10158. pp. 122.
6. William Mendenhall, Robert J. Beaver, Barbara M. Beaver Introduction to Probability and Statistics. 13th EDITION, 2009, pp. 777.
7. Dean Chalmers Series Editor: Julian Gilbey Cambridge International AS & A Level Mathematics: Probability & Statistics 1Coursebook. Cambridge University Press. First published 2018, pp. 266.
8. Emelyanov, G. B. Task on the theory of probability and mathematical statistics: textbook / Г. В. Emelyanov, V.P. Skitovich. — 3rd ed., ster. — Saint Petersburg: Lan, 2019. — 332 c.

Assessment

Attendance	10%	At least 75% class attendance is compulsory

Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Mechanics and Mathematics"

Course Unit Title	Physics
Course Unit Code	İF-BO6
Type of Course Unit	Compulsory
Level of Course Unit	1st year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hours/week)	2

Practice (hours/week)	0.67
Laboratory (hours/week)	0.33
Year of Study	1
Semester when the course unit is delivered	1
Course Coordinator	Salimov Ilham Nasir
Name of Lecturer(s)	Salimov Ilham Nasir
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

To form the relevant knowledge, skills and habits in students, to ensure their ability to conduct physical experiments, analyze the results and analyze the data obtained

Course Objectives:

To instill in students the laws of electromagnetism, optics, atomic and nuclear physics. To introduce students to visual aids and do practical work throughout the course. To learn the connection of physics to life and to be able to apply it to various fields.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	The main form of delivery of course material is lectures. An important aspect of physics lectures is that real and computer-based physical experiments should be conducted, educational films, and model computer programs should be used. Important sections of the course program can be taken up in seminar classes. As a rule, theoretical materials requiring complex mathematical apparatus and various methods of solving problems are considered in seminars. Students can receive various types of homework to consolidate the materials received in seminars. They will practically understand the subject by performing laboratory work	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	4

2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	3
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	3
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	2
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Vectors and operations on them. Vector and scalar quantities. System of units and measurement of physical quantities. Mechanical motion. Rectilinear motion of a material point and equations of motion. Acceleration, uniformly accelerating and uniformly decelerating motion. **Seminar 1**	
2		Curvilinear motion along a circle, characterizing quantities - acceleration, angular and linear velocity. Dynamics. Inertial calculation systems. Newton's I and II laws. Concept of force and mass. Weight of an object, gravitational force. Weightlessness. Newton's III law.	

		Seminar 2	
3		Lecture 1. Elastic forces. Hooke's law. Mechanical stress. Friction force, types, friction coefficient. Gravitational force. Law of universal gravitation. Gravitational constant Mechanical work. Power, units of measurement. Impulse. Energy. Kinetic and potential energy. Law of conservation of mechanical energy. Law of conservation of momentum	
4		Molecular kinetic concept. Basic provisions of molecular kinetic theory and their experimental confirmation. Ideal gases. Isoprocesses. Equation of state of an ideal gas, graphs. Real gases. Force of interaction of molecules, Van der Waals equation **Seminar 3**	
5		Lecture 2. Dance movement. Mathematical and spring dancers. Period of dance. Harmonic dances. Equations of harmonic dance. Mechanical waves and their types. Wavelength. Interference of waves	
6		Lecture 3.Electrostatics. Electric charge, their mutual force. Coulomb's law. Electric field intensity. Intensity vector flux. Relationship between electric field intensity and potential. Potential difference	
7		Dielectrics. Dielectrics in an electric field. Polarization of dielectrics. Magnetoelectrics, piezoelectric effect. Electric capacity, units. Capacitors. Energy of a capacitor, series and parallel connection **Seminar 4**	
8		Lecture 4.Constant electric current. Conditions for the occurrence of current. Ohm's law for a circuit part. Resistance of wires. Specific resistance. Series and parallel connection of wires. Coulomb-Lens law. Ohm's law for a complete circuit, EHQ	
9		Lecture 5.Structure and properties of solids. Theory of zones. Electric current in gases. Non-independent and independent discharges. Types of non-independent discharges.Thermionic emission phenomenon	
10		Electric current in semiconductors. Types of electrical conductivity of semiconductors, specific and additive conductivity. Semiconductor diode, transistors Electric current in liquids. Electrolytic dissociation. Faraday's laws for electrolysis **Seminar 5**	
11		Lecture 6. Magnetic field and its characteristics. Interaction of current-carrying wires. Magnetic induction of the field. Magnetic field of a wire with current. Ampere's law. "Left hand" rule	
12		Lecture 7. The movement of charged particles in a magnetic field. Lorentz force. Magnetic flux. The phenomenon of electromagnetic induction. Induction current. The phenomenon of self-induction,	

		inductance. Lenz's rule	
13		Lecture 8. Alternating current. Ohm's law for alternating current circuits. Transformers, principle of operation. Distribution and transmission of electrical energy over long distances	
14		Elements of geometric optics. Thin lens, Linzal's formula. Optical power of the lens Diopter. Linear magnification of the lens. Wave properties of light. Interference of light. Coherence **Seminar 6**	
15		Lecture 9. Structure of the atom. Thomson model of the atom. Rutherford experiment. Planetary model of the atom. Bohr theory. Bohr postulates, its shortcomings. Stationary states	
		Laboratory 1. Introduction to laboratory work. Understanding errors. Determining the acceleration of gravity using a mathematical dancer.	
		Laboratory 2. Coulomb potential and Coulomb field of metal surfaces, determination of the charge of a sphere. Calculation of the interaction force between charged particles	
		Laboratory 3. Determination of capacitance in a capacitor, dielectric constant of the medium	

Recommended Sources

TEXTBOOK(S)

1. Gojayev Niftali Mehrali oglu. General physics course. Volume IV (optics). [textbook for higher education institutions]. Baku 2011.540 p.
2. RMRzayev.Fnzika, [textbook for higher schools]. Baku 2015.736 p.
3. Aliyev Bayram Zeynal oglu. General physics course. Baku, Elm, 2010, 294p.
4. Ahmadov Faig Abdulavvel oglu. General Physics Course Textbook for Higher Education Institutions. Baku, 2006, 348 p.
5. BD Aliyev, QT Hasanov. General physics course. Textbook for higher education institutions. Baku, 2004, 660 p.
6. Gojayev EM, Safarov NY “Applied Physics” Baku “AzTU “2018, 393 p..
7. Q.T. Hasanov, A.A. Aliyev. General physics course. . [textbook for higher education institutions]. Baku 2015. 440 p.
8. M.Murguzov, A.Alekperov, O.Hasanov. General physics course. [textbook for higher education institutions]. Baku 2011-322 p.
9. Eyvazov E.A, Farajov VC, Gurbanov SS “Introduction to the Physics of Semiconductors” Baku “Chinar Çap” 2007, 392 p.
10. Eyvazov E.A. “Physics of Solids” Baku “Education” 2003, 455p
11. Hasanov I.S. “Plasma and batch technology” Baku “Science” 2007, 171p.
12. A.S.Abdinov, I.S.Hasanov, T.H.Huseynov “Fundamentals of electronic devices and emission electronics” Baku 2011, 358 p.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	

Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**150**
Total Workload/30(h)	**150/30**
ECTS Credits of the Course	**5**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Fundamentals of Computer Engineering
Course Unit Code	İF-BO7
Type of Course Unit	Compulsory
Level of Course Unit	1st year
National Credits	
Number of ECTS Credits Allocated	8
Theoretical (hours/week)	3
Practice (hours/week)	2

Laboratory (hours/week)	
Year of Study	1
Semester when the course unit is delivered	1
Course Coordinator	Hajiyeva Rena Javadkhan
Name of Lecturer(s)	Hajiyeva Rena Javadkhan
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

The subject "Fundamentals of Computer Engineering" covers ICT, its application areas, the structure of the main and peripheral devices of the computer, the classification of operating systems, including the Windows operating system, the organization of databases, and information management.

Course Objectives:

The purpose of the subject "Fundamentals of Computer Engineering" is to form a worldview, relevant knowledge and skills about information processes, ICT, its characteristics, application, information management, and database creation.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about information processes	1, 2
2	Formation of ideas about information technologies and their application areas	1, 2
3	Formation of perceptions about information management	1, 2
4	Formation of ideas about database management system and database creation	1, 2
5	Formation of ideas about spreadsheet organization technologies	1, 2
6	Computer networksformation of ideas about and the ability to use them	1, 2
7	Formation of the ability to use information technologies that are most commonly used in education and specialization	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL

1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	4
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. ICT as a fundamental science and its challenges Lesson 2. Development stages of computer engineering. Concept of information, properties, forms, units of measurement **Seminar 1**	
2		Lesson 3. Computer software. HardWare- technical support. SoftWare-software. BrainWare-instrumental support **Seminar 2**	

3		Lesson 4. History of computer development and architecture Lesson 5. Computer core and peripheral devices **Seminar 3**	
4		Lesson 6. Classification of operating systems. Structure of the Windows operating system **Seminar 4**	
5		Lesson 7. Windows operating system, basic settings. Windows system menus and windows. Using and applying standard Windows operating system hotkeys in practice Lesson 8. Word processors. Word text editor and its main capabilities **Seminar 5**	
6		Lesson 9.Graphic capabilities of the Word text editor. Mathematical software packages **Seminar 6**	
7		Lesson 10. Computer graphics. Color models. Paint graphics editor and its main capabilities Lesson 11. Electronic presentations. The main capabilities of the Power Point presentation program **Seminar 7**	
8		Lesson 12. MS Excel spreadsheet. Cell, block, page. Creating charts. Filter and sort operations **Seminar 8**	
9		Lesson 13. Classification of functions in Excel. Functions of mathematical, statistical, financial, text, logical and other categories Lesson 14. Ways to plot graphs of mathematical functions in Excel. Calculation of accounting problems **Seminar 9**	
10		Lesson 15. Classification of Database Management Systems **Seminar 10**	
11		Lesson 16. Information systems and their classification. General information about MS Access VBIS Lesson 17. Basic capabilities of Access VBIS **Seminar 11**	
12		Lesson 18. Tables, queries, forms, reports	

		Seminar 12	
13		Lesson 19.Classification, architecture, types, topology of computer networks. Structure of the Internet network Lesson 20.Computer networks. Architecture and topology of computer networks **Seminar 13**	
14		Lesson 21. Classification of browsers. The structure of the global Internet network **Seminar 14**	
15		Lesson 22. Classification of robots Lesson 23. Information security **Seminar 15**	

Recommended Sources

TEXTBOOK(S)

1. Informatics. Baku, Publishing and Printing Center of the State University of Information Technology, 2020, 180 p.
2. Karimov SQ, Habibullayev SB, Ibrahimzade T.I.. Informatics. Textbook for higher education institutions. Baku, 2019.
3. Aliyev AY Informatics and Programming. Baku, Mutarcim, 2008.
4. Aliyev A.A., Aliyev AY, Kazimov CK Fundamentals of Informatics, Baku, Translator, 2009.
5. Mehdiyeva QY, Aliyev AY, Piriverdiyev V.A. Programming issues. Baku, Baku University, 2004.
6. Mehtieva G.Yu., Aliyev A.Yu., Piriverdiev V.A. Programming practice. Baku, Baku University, 2004.
7. A.M.Abbasov, R.A.Guliyev, A.K.Karimov, M.H.Azadova. MS Access. Textbook, Baku, 2005.
8. Abbasov A., Alizade M., Seyidzade E., Salmanova M. Fundamentals of Informatics and Computerization. Baku, "Elm", 2005.
9. Computer science. Basic course: Учебник узов / Под ред. С.В. Simonovich. St. Petersburg: Peter, 2019.
10. Khalilov M. Informatics. Baku, 2009.
11. Ibrahim-zade T., Sardarov Y. Fundamentals of computer networks and software. Baku, 2008.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	

Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload	
Total Workload	**240**
Total Workload/30(h)	**240/30**
ECTS Credits of the Course	**8**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Fundamentals of Programming
Course Unit Code	İF-BO8
Type of Course Unit	Compulsory
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	8
Theoretical (hours/week)	3
Practice (hours/week)	2
Laboratory (hours/week)	
Year of Study	2
Semester when the course unit is delivered	3

Course Coordinator	Gahramanli Turkan
Name of Lecturer(s)	Gahramanli Turkan
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
"Programming Fundamentals" courseProgramming is a branch of computer science that studies the methods and construction methods of algorithms, their properties. Algorithmization of a problem means the development of an algorithm for solving a problem using a computer. An algorithm is a sequence of finite number of operations performed to achieve a set goal. In order to solve a problem on a computer, the algorithm for solving this problem must be written in the form of a program.

Course Objectives:
The course on the basics of programming widely involves learning and using modern technical tools. Therefore, future specialists studying in relevant areas must master the capabilities of technical tools.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about the goals and objectives of the science of teaching methodology "Fundamentals of Programming", scientific research methods, and its relationship with other sciences	1, 2
2	Formation of ideas about the forms of organizing the “Basics of Programming” training	1, 2
3	Formation of ideas about the tools of the "Basics of Programming" training	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	4
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3

4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	3
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	3
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. Computer software. Basic concepts and principles of programming Lesson 2**.** Classification of programming languages **Seminar 1**	
2		Lesson 3. Data, data types. Operations. Expressions **Seminar 2**	
3		Lesson 4. Basic constructions of algorithms Lesson 5. Building block diagrams of linear algorithms **Seminar 3**	
4		Lesson 6. Basic elements of algorithmic languages **Seminar 4**	
5		Lesson 7. Data input and output. Assignment operator. Standard input and output procedures	

		Lesson 8. Structure of a C++ program. Sections of a C++ program. Descriptions section. Operators section. Connection of modules, description of symbols, constants, types, variables, description of procedures and functions **Seminar 5**	
6		Lesson 9. General form of the if operator. Short form of the if operator. Using nested if operators **Seminar 6**	
7		Lesson 10.Compound operator. Selection (variant) operator. User types Lesson 11. Loop operators. Nested loops. Parametric loop operator for. Its general form **Seminar 7**	
8		Lesson 12.Subroutines. Standard procedures and functions. Definition of a subroutine **Seminar 8**	
9		Lesson 13. Types of subroutines. Procedures. Functions Lesson 14. Comparison of procedures and functions **Seminar 9**	
10		Lesson 15. Creating a library of modules, subroutines. Module concept **Seminar 10**	
11		Lesson 16. Module structure. Interface part of the module, necessary implementation part Lesson 17. Files. File structure. Types of files. Text files **Seminar 11**	
12		Lesson 18. Typed files. Untyped files. Declaring files. Standard procedures and functions related to files **Seminar 12**	
13		Lesson 19. Object-oriented programming. Classes, objects, properties, events, methods. Components Lesson 20. C++ system. Creating programs in the C++ environment **Seminar 13**	
14		Lesson 21. Features of the C++ system	

		Seminar 14	
15		Lesson 22. Integrated C++ environment for software development Lesson 23. Creating, editing, debugging, saving, and loading applications in C++ **Seminar 15**	

Recommended Sources

TEXTBOOK(S)

1. Aleksandrov V.V., Maskin S.S., Matyuhin V.V., Rashid A., Sigaev S.M., Biryulev D.S. Standardization of the treatment-diagnostic algorithm in patients with closed abdominal trauma and unstable hemodynamics // University Clinic. 2022. No. S1. C. 15-16.
2. Remizova O.I., Algorithmization and programming (C++), MICиC, 2021
3. Khalilov M. Informatics. Baku, 2009.
4. Ibrahim-zade T., Sardarov Y. Fundamentals of computer networks and software. Baku, 2008.
5. “INFORMATICS” M. Alizadeh, M. Salmanova, X. Abbasva, M. Orujova, E. Seyidzadeh, textbook, Baku 2015
6. Gribanov V.P., Kalmykova O.V., Soroka R.I. Fundamentals of algorithmic programming and programming, M., Изд.центр ЕАОИ.-2008.
7. Semakin I.G., Shestakov A. P. Fundamentals of algorithmization and programming.-M. : Изд-во «Академия» 2008 г.
8. Kutuzov M., Preobrazhensky A. Выбор и моднизирация компутер: Анатомия ПК., Peter, 2004, 320c.
9. Krymov B. Diagnostics PC from scratch! + CD. Лучшие книги, 2006, 268 c.
10. Solomenchuk V.G., Solomenchuk P.V. Железо ПК 2007. БХВ-Петербург, 2007 г., 496c.
11. Tyunin N.A. LCD monitors: application to the journal "Remont and Service".

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies • Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations	
ECTS allocated based on Student Workload	
Total Workload	**240**
Total Workload/30(h)	**240/30**
ECTS Credits of the Course	**8**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Data Structures and Algorithms
Course Unit Code	İF-BO9
Type of Course Unit	Compulsory
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hours/week)	3
Practice (hours/week)	3
Laboratory (hours/week)	
Year of Study	2
Semester when the course unit is delivered	4
Course Coordinator	Mustafayev Gorkhmaz Nureddin oglu
Name of Lecturer(s)	Mustafayev Gorkhmaz Nureddin oglu
Name of Assistant(s)	-

Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

Dear Students!

Welcome! I'm excited to have you in this class and look forward to the opportunity to learn, grow, and explore new ideas together. As we dive into the material, I encourage you to engage actively, ask questions, and make the most of our time together.

This course is designed to challenge you, but also to foster an environment where you can expand your knowledge and develop skills that will be valuable both in your academic journey and beyond. Please feel free to reach out to me if you have any questions or need clarification throughout the semester. I'm here to support you!

Let's make this a great semester!

Best regards,

Course Objectives:
Data Structures and Algorithms (DSA) is an essential skill for any programmer looking to solve problems efficiently.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Understanding and utilizing DSA is especially important when optimization is crucial, like in game development, live video apps, and other areas where even a one-second delay can impact performance. Big companies tend to focus on DSA in coding interviews, so if you're good at it, you're more likely to land those higher-paying jobs.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks	3

	and achieve goals	
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	4
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	4
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. Getting Started with DSA Lesson 2. What is an algorithm? **Seminar 1**	
2		Lesson 3.Data Structure and Types **Seminar 2** **Seminar 3**	
3		Lesson 4. Why learn DSA? Lesson 5.Stack **Seminar 4**	
4		Lesson 6.Queue **Seminar 5** **Seminar 6**	
5		Lesson 7.Types of Queues Lesson 8.Circular Queue **Seminar 7**	
6		Lesson 9.Priority Queue **Seminar 8** **Seminar 9**	

7		Lesson 10.DequeOperations on a Fibonacci Heap Lesson 11.Linked List **Seminar 10**	
8		Lesson 12.Linked List Operations.Tree Data Structure **Seminar 11** **Seminar 12**	
9		Lesson 13. Types of Linked Lists Lesson 14. Hash Table Binary Tree **Seminar 13**	
10		Lesson 15. Heap Data Structure **Seminar 14** **Seminar 15**	
11		Lesson 16. Fibonacci HeapTree Traversal Lesson 17.Decrease Key and Delete Node Operations on a Fibonacci Heap **Seminar 16**	
12		Lesson 18. Tree Data Structure **Seminar 17** **Seminar 18**	
13		Lesson 19.Tree Traversal Lesson 20.Binary Tree **Seminar 19**	
14		Lesson 21. Full Binary Tree **Seminar 20** **Seminar 21**	
15		Lesson 22.Perfect Binary Tree Spanning Tree Lesson 23.Decrease Key and Delete Node Operations on a Fibonacci Heap **Seminar 22**	

Recommended Sources

TEXTBOOK(S)

1. Introduction to Algorithms. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	

Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload	
Total Workload	**180**
Total Workload/30(h)	**180/30**
ECTS Credits of the Course	**6**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Database Systems
Course Unit Code	İF-B10
Type of Course Unit	Compolsory
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	7
Theoretical (hours/week)	4
Practice (hours/week)	2
Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	5
Course Coordinator	Sema Bayramova Gadir

Name of Lecturer(s)	Sema Bayramova Gadir
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
To form appropriate knowledge, skills and habits in students, and to ensure their preparation for working with computers.

Course Objectives:
"Database systems"The main objective of the subject is to teach students the basic concepts, structure, and management principles of databases. This subject covers both theoretical and practical knowledge.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	The subject "Database Systems" aims to provide students with theoretical and practical knowledge on structured storage, management, and effective access to data. The subject covers topics such as database models, mainly the relational model and its application, writing queries using SQL, database design, normalization principles, and data integrity and security.	1, 2
2	The course also develops the ability to work with modern database management systems (DBMS), and provides students with the opportunity to solve real-world problems by completing practical assignments on real projects. Students acquire basic skills in the design, implementation, and management of databases.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	4
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3

4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	4
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. The essence of methods for describing knowledge. Requirements for methods of presenting knowledge. Lesson 2. The concept of knowledge. What is a knowledge repository? Methods of describing knowledge and its essence **Seminar 1**	
2		Lesson 3. Information systems and databases. Database concept Lesson 4. Evolution of information system. Database and information system. Data warehouse **Seminar 2**	
3		Lesson 5.Database management systems Lesson 6. Managing VB. Classification of VB. Creating a database in ACCESS. **Seminar 3**	
4		Lesson 7.Database design stages Lesson 8. Normalization of the essence. Construction of the ER diagram. Models of VB **Seminar 4**	

5		Lesson 9. Structured Query Language – SQL language. MySql application window Lesson 10. POSTGRESQL – a dialect of SQL. A typical comparison of ORACLE and MySql. The connection between the database and PHP **Seminar 5**	
6		Lesson 11. Data types in MySQL Lesson 12. Data types in Oracle. Comparison of data types in MySQL and POSTGRESQL. Data in ACCESS **Seminar 6**	
7		Lesson 13. SQL's sublanguage – DDL (Data Definition Language) Lesson 14. Commands of the DDL sublanguage of SQL and an example of each. Data definition language in other dialects of SQL. Applying constraints (CHECK, FOREIGN KEY) on related tables. **Seminar 7**	
8		Lesson 15. SQL's sublanguage – DML (data manipulation language) Lesson 16. Commands of the DML sublanguage of SQL and an example of each. The DELETE operator and its application to related tables. Application of the SELECT operator to multiple tables – in examples **Seminar 8**	
9		Lesson 17. SQL's sublanguage – TCL language Lesson 18. Commands of the TCL sublanguage of SQL and examples of each. What is a transaction? Canceling a transaction **Seminar 9**	
10		Lesson 19. SQL's sublanguage – DCL language Lesson 20. Commands of the SQL DCL sublanguage and examples of each. Ensuring database integrity. Applying sublanguage commands to the database at different levels **Seminar 10**	
11		Lesson 21. Aggregate functions Lesson 22. Trigonometric functions in MySql. Logical functions in MySql. Aggregate functions **Seminar 11**	
12		Lesson 23.Group by and Where conditional functions Lesson 24. Grouping operator in MySQL and its examples. Conditional operators. Ordering operator **Seminar 12**	
13		Lesson 25.Commands for joining tables and queries Lesson 26. Query join operators. Table join operators. Inner and outer join **Seminar 13**	
14		Lesson 27. Comparison operators. Subqueries Lesson 28. Subqueries and their examples. Comparison operators and their examples. Logical operators and their examples **Seminar 14**	

15		Lesson 29. Database import, export and storage operations Lesson 30. Exporting a database to other formats Importing tables to a database in other formats. Creating and saving a database **Seminar 15**	

Recommended Sources

TEXTBOOK(S)

1. https://www.mbit.edu.in/wp-content/uploads/2020/05/An-Introduction-to-Database-Systems-8e-By-CJ-Date-CodeBlah.com_.pdf
2. https://www.london.ac.uk/sites/default/files/study-guides/database-systems.pdf
3. https://webweb.ams3.cdn.digitaloceanspaces.com/data/simmcdev.webweb.ai.in/MCAdigitalbook/DBMS-20240629T071926Z-001/dbms-peter-rob.pdf
4. SQL extended version, Samadov Samir, Samadov Ramin. Baku, European Publishing House 2013, p. 224
5. PHP, Sercan Cakir. Istanbul, p. 485
6. Базы данных, I.P. Karpova. Peter publishing house, 2013, p. 240. Information systems, SQKarimov, 2008, p. 676
7. SQ Karimov, SBHabibullayev, T.I.Ibrahimzade. Informatics (Textbook). Baku 2011, 434 p.
8. SQ Karimov. Information systems. Baku-Elm 2008, 676 pages

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**210**
Total Workload/30(h)	**210/30**

ECTS Credits of the Course	**7**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Operating Systems
Course Unit Code	İF-B11
Type of Course Unit	Compulsory
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	8
Theoretical (hours/week)	3
Practice (hours/week)	3
Laboratory (hours/week)	
Year of Study	2
Semester when the course unit is delivered	3
Course Coordinator	Mustafayeva Sabina Fazil
Name of Lecturer(s)	Mustafayeva Sabina Fazil
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-
Course description: (A brief description of the subject, the purpose of teaching the subject, the methods to be applied in teaching the subject are explained in writing. What students will know, what they will achieve, and what skills they will acquire by studying this subject are noted.) The role of the subject of operating systems in science, technology, and other fields. Computer software, the concept of the Windows operating system, the architecture of the Windows system, its main parameters, and the working principle are explained. The desktop, working with windows, setting the main parameters, working with	

folders and files, and working with other operating systems.

Course Objectives:
Ensuring the scientific and methodological preparation of future specialists (goals and content of Informatics training, forms of organization of training, methods and tools, modern training technologies), forming in them the relevant knowledge, skills and habits for implementing training, familiarizing them with the accumulated experience in teaching Informatics, and forming the ability to think logically.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about the goals and objectives of operating systems as a science, scientific research methods, and its relationship with other sciences	1, 2
2	Formation of ideas about the forms of organizing operating systems training	1, 2
3	Formation of ideas about operating systems training tools	1, 2
4	Formation of ideas about the principles and training methods of operating systems training	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	4

9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. General information about operating systems Lesson 2. History of the development of operating systems **Seminar 1**	
2		Lesson 3.Windows operating system and its versions **Seminar 2** **Seminar 3**	
3		Lesson 4. File and directory organization Lesson 5.Organizing folders **Seminar 4**	
4		Lesson 6. FAT, VFAT, FAT32, file systems **Seminar 5** **Seminar 6**	
5		Lesson 7. HPFS, NTFS file systems Lesson 8. Types of architecture of operating system kernels **Seminar 7**	
6		Lesson 9.Important principles of building operating systems **Seminar 8** **Seminar 9**	
7		Lesson 10.Classification of interfaces Lesson 11. WIMP, SILR, POSIX interfaces **Seminar 10**	
8		Lesson 12. Windows operating systems **Seminar 11** **Seminar 12**	
9		Lesson 13.New technologies applied in the WINDOWS operating system Lesson 14. Network operating systems **Seminar 13**	
10		Lesson 15. Databases in network operating systems **Seminar 14** **Seminar 15**	

11		Lesson 16. Unix Operating System (OS) Lesson 17. Ensuring operating system security **Seminar 16**	
12		Lesson 18. Deadlocks and methods for handling them **Seminar 17** **Seminar 18**	
13		Lesson 19. Threads Lesson 20. Linux operating system and its structure **Seminar 19**	
14		Lesson 21. Mobile operating systems **Seminar 20** **Seminar 21**	
15		Lesson 22.iOS operating systems Lesson 23.Android operating systems **Seminar 22**	

Recommended Sources

TEXTBOOK(S)

1. SQ Karimov, SB Habibullayev, T.I. Ibrahimzadeh “Informatics” Baku-2013;
2. A.M. Rustamov “Informatics” Baku-2013;
3. William Stollings Operating Systems 2004;
4. Tanenbaum E.S., Bos Kh. Modern operating systems. 4th edition. 2015;
5. Gordeev A.V. Operating systems 2nd edition. 2007;
6. Olifer V.G., Olifer N.A. Network operating systems. 2nd edition. 2009;

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies • Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations	
ECTS allocated based on Student Workload	
Total Workload	**240**
Total Workload/30(h)	**240/30**
ECTS Credits of the Course	**8**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Computer Networks
Course Unit Code	İF-B12
Type of Course Unit	Compulsory
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	8
Theoretical (hours/week)	3
Practice (hours/week)	3
Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	5
Course Coordinator	Rzaguliyev Alikhan Ilgar
Name of Lecturer(s)	Rzaguliyev Alikhan Ilgar oglu
Name of Assistant(s)	-
Mode of Delivery	Face to Face

Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
To form appropriate knowledge, skills and habits in students, and to ensure their preparation for working with computers.

Course Objectives:
Brief information about the subject, the purpose of teaching the subject, and the methods to be applied in teaching the subject are explained in writing. It is stated what students will know, what they will achieve, and what skills they will acquire by studying this subject.) Systems analysis, the role of the subject in science, technology, and other fields, types of analysis, risk management, communication, and the main parameters and working principles of programs and software used for systems analysis are explained.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about the goals and objectives of systems analysis as a science, scientific research methods, and its relationship with other sciences	1, 2
2	Formation of ideas about the forms of systems analysis	1, 2
3	Formation of ideas about the tools of systems analysis training	1, 2
4	Formation of ideas about the principles and training methods of systems analysis training	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5

6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	4
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. Introduction to computer networks Lesson 2. History and basic terminology of computer networks. Network topologies Seminar 1. What are computer networks?	
2		Lesson 3. Network devices. Routers. Modems. Firewalls Seminar 2. History and basic terminology of computer networks. Network topologies Seminar 3. Network devices. Routers. Modems. Firewalls	
3		Lesson 4. Innovations in computer networks and how to protect them Lesson 5. Internet of Things (IoT). Internet and web Seminar 4. Innovations in computer networks and how to protect them	
4		Lesson 6. Computer network types by scale Seminar 5. Internet of Things (IoT). Internet and web Seminar 6. Computer network types by scale	
5		Lesson 7. Role of computer networks in commerce Lesson 8. The role of computer networks in air transport Seminar 7. Role of computer networks in commerce	
6		Lesson 9. TCAS, ACAS and other systems. Their role in the network Seminar 8. The role of computer networks in air transport Seminar 9. TCAS, ACAS and other systems. Their role in the network	

7		Lesson 10. Satellite networks and related systems. ADS-B. ILS. MLS and other computer systems Lesson 11. OSI Model. TCP/IP Model Seminar 10. Satellite networks and related systems. ADS-B. ILS. MLS and other computer systems	
8		Lesson 12. Client-Server Architecture. Peer-to-Peer (P2P) Architecture. Data Transmission Seminar 11. OSI Model. TCP/IP Model Seminar 12. Client-Server Architecture. Peer-to-Peer (P2P) Architecture. Data Transmission	
9		Lesson 13. Network Protocols. Communication Protocols Lesson 14. IP Addressing and Subnetting. Ethernet and LAN Technologies. MAC address Seminar 13. Network Protocols. Communication Protocols	
10		Lesson 15. Wireless Networking. Wireless network standards Seminar 14. IP Addressing and Subnetting. Ethernet and LAN Technologies. MAC address Seminar 15. Wireless Networking. Wireless network standards	
11		Lesson 16. Network Security. Cyber security. Cryptography Lesson 17. Telecommunications networks. Network Neutrality. Virtualization in Networking Seminar 16. Network Security. Cyber security. Cryptography	
12		Lesson 18. Cloud. Cloud Networking. Quality of Service (QoS). Proxy Servers Seminar 17. Telecommunications networks. Network Neutrality. Virtualization in Networking Seminar 18. Cloud. Cloud Networking. Quality of Service (QoS). Proxy Servers	
13		Lesson 19. Mobile Networks. Mobile Ad Hoc Networks (MANETs) Lesson 20. Troubleshooting. Domain Name System (DNS) Seminar 19. Mobile Networks. Mobile Ad Hoc Networks (MANETs)	
14		Lesson 21. Software of computer networks Seminar 20. Troubleshooting. Domain Name System (DNS) Seminar 21. Software of computer networks	
15		Lesson 22. Windows. Linux. UNIX and other operating systems Seminar 22. Windows. Linux. UNIX and other operating systems Seminar 23. General information	

Recommended Sources

TEXTBOOK(S)

1. Hajiyeva RC Informatics. Collection of lectures, Polygraphic and Publishing Center of the State University of Baku, Baku, 2020, 180 p.
2. Shirokova A. I., Pyshniak M. Informatics. Разработка программ на языке программирования Piton, M., 2020, 144 p.
3. Alizade MN, Orujova TV, Hasanova N.A. Information security. Baku, “MSV Publishing”, 2018, 388 p.

4. Alizadeh MN, Gurbanov BA, Hajizadeh SM Computer Graphics (Lecture materials and tests) Baku, “Sada” publishing house, 2010, 544 p.
5. Seyidzadeh E., Alizadeh M., Babayev A. Architecture of Computer Systems B: “Seda” 2011.
6. Savelyeva, A.Ya. Основы информатики/ Савельева, А.Я// Учебник для УЗов. -Moscow.: Просвещение. 2010.
7. SQKarimov, SBHabibullayev, T.I.Ibrahimzade. Informatics. Textbook for higher education institutions. Baku, 2009.
8. Informatics for economists. Учебник для бачалериата и специалитета / ed. Poliakov V. P. M.: Yurayt, 2019. 524 c.
9. Nabiullina S.N. Informatics and ICT. Course lecture. M.: Lan, 2019. 72 p.
10. Gasumova S. E. Social informatics. Textbook and practice for universities. M.: Yurayt, 2019. 284 c.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**240**
Total Workload/30(h)	**240/30**
ECTS Credits of the Course	**8**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Computer Architecture
Course Unit Code	İF-B13
Type of Course Unit	Compulsory
Level of Course Unit	1st year
National Credits	
Number of ECTS Credits Allocated	8
Theoretical (hours/week)	3
Practice (hours/week)	2
Laboratory (hours/week)	
Year of Study	1
Semester when the course unit is delivered	2
Course Coordinator	Mustafayeva Sabina Fazil
Name of Lecturer(s)	Mustafayeva Sabina Fazil
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
The course "Computer Architecture" covers the functional-structural organization of a personal computer, information management device, information display device, and is intended to teach students important concepts and basic knowledge. The course consists of theoretical and seminar lessons. Here, all technical concepts are described, explained, and theirSections on its application and modern use are reflected.

Course Objectives:
The study and use of modern technical tools is widely practiced in the "Computer Architecture" course. Therefore, students studying in the relevant areasFuture specialists must master the capabilities of technical tools.

Learning Outcomes

At the end of the course the student will be able to	Assessment

1	Formation of ideas about the goals and objectives of the science of teaching methodology "Computer Architecture", scientific research methods, and its relationship with other sciences	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		
Course's Contribution to the Program		
		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	3
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		
Course Contents		

Week	Chapter	Topics	Exam

1		Lesson 1. History of the development of computers Seminar 1	
2		Lesson 2. Basic computer components Lesson 3. Introduction. Von Neumann architecture Seminar 2	
3		Lesson 4. Computer, structural diagram of HS Seminar 3	
4		Lesson 5. RAM and cache memory Lesson 6.External storage devices Seminar 4	
5		Lesson 7. Internal structure of a microprocessor Seminar 5	
6		Lesson 8. Addressing modes referring to the instruction counter register, stack organization Lesson 9. Command system and operands. Addressing Seminar 6	
7		Lesson 10. Computer information exchange with external devices Seminar 7	
8		Lesson 11. Internal storage devices Seminar 8	
9		Lesson 12. Computer system unit and microprocessors Seminar 9	
10		Lesson 13. Controller and bus Lesson 14. Principles of operation of monitors Seminar 10	
11		Lesson 15. BIOS and CMOS chip Lesson 16. RAM internal memory device Seminar 11	
12		Lesson 17. System block Lesson 18. TV-tuner. Projector. Their types Seminar 12	
13		Lesson 19. Digital cameras. Their types and software Seminar 13	
14		Lesson 20. Computer output devices. Liquid crystal, LED, plasma and other technologies. Monitors Seminar 14	
15		Lesson 21. External audio equipment Lesson 22. Communication devices. Modem and types of modems Seminar 15	

Recommended Sources

TEXTBOOK(S)

1. Traskovsky A. BIOS. BHV-Petersburg, 2007. 155s.
2. Guk M.Yu. Hardware IBM PC: Encyclopedia. Peter, 2006. 1072 p.
3. Tanenbaum E. Architecture of the computer. Peter, 2006, 698 c.
4. Zhmakin A.P. Computer architecture + CD. Учебное пособие, BHV-Petersburg, 2006, 315.
5. Kuzin A.V., Peskova S.A. Architecture of computers and computing systems Textbook for
6. ССУЗов, Forum, 2006, 350 c.
7. Maksimov N.V., Partyka T.L., Popov I.I. Architecture of computers and computing systems. Учебник для ССУЗов, Forum, 2007, 511p.
8. Kutuzov M., Preobrazhensky A. Выбор и моднизирация компутер: Анатомия ПК., Peter, 2004, 320c.
9. Krymov B. Diagnostics PC from scratch! + CD. Лучшие книги, 2006, 268 c.
10. Solomenchuk V.G., Solomenchuk P.V. Железо ПК 2007. БХВ-Петербург, 2007 г., 496c.
11. Tyunin N.A. LCD monitors: application to the journal "Remont and Service".

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**240**
Total Workload/30(h)	**240/30**
ECTS Credits of the Course	**8**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Theory of circuits
Course Unit Code	İF-B14
Type of Course Unit	Compulsory
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	7
Theoretical (hours/week)	3
Practice (hours/week)	3
Laboratory (hours/week)	
Year of Study	2
Semester when the course unit is delivered	3
Course Coordinator	Aliyev Goshgar Seyfulla oglu
Name of Lecturer(s)	Aliyev Goshgar Seyfulla oglu
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-
Course description: Students pursuing a bachelor's degree in Computer Engineering must be able to analyze various electrical and electronic circuits. Graduates of this major are primarily engaged in research and scientific-practical work in areas where information and communication technologies are used.	
Course Objectives: The theoretical foundations of linear electric circuits serve as the main theoretical basis used in the training of specialists in the field of electrical engineering and radio engineering. The main goal of the subject taught is to assist students in their independent work and to increase the effectiveness of mastering the subject.	
Learning Outcomes	

At the end of the course the student will be able to		Assessment
1	Formation of ideas about the subject, basic concepts and elements of circuit theory	1, 2
2	Formation of the knowledge and skills necessary for the use of current-voltage relationships in resistances, capacitances, inductances, constant current and voltage sources, and the calculation of power and energy	1, 2
3	Mastering Ohm's and Kirchhoff's laws and developing the ability to apply them in voltage and current division circuits and series/parallel conversions	1, 2
4	Mastering Thevenin and Norton theorems and developing the ability to apply them in the analysis of DC circuits	1, 2
5	Formation of the ability to analyze first-order electrical circuits	1, 2
6	Formation of the ability to analyze circuits where a stable sinusoidal voltage is applied.	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	4
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	3
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	4
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	3

9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. Elements of an electrical circuit.Current and voltage. Ohm's law Lesson 2. Series circuits. Series connected voltage sources Seminar 1	
2		Lesson 3. Parallel circuits: parallel elements, Kirchhoff's current law Seminar 2 Seminar 3	
3		Lesson 4. Kirchhoff's voltage law. Voltage division rule. Types of circuits and circuit elements Lesson 5. Current division rule, parallel connection of voltage sources, open and short circuits Seminar 4	
4		Lesson 6. Series-parallel circuits: using a voltage divider as a voltage source. Grounding Seminar 5 Seminar 6	
5		Lesson 7. Transition processes in capacitor circuits. Series and parallel connected capacitors. Energy stored in a capacitor Lesson 8. Inductors: RL circuits. Series and parallel connected inductances Seminar 7	
6		Lesson 9. Circuit theorems: linearity, superposition, Thevenin's and Norton's theorems Seminar 8 Seminar 9	
7		Lesson 10. Capacities: electric field, capacitance, leakage current, type of capacitances Lesson 11. Mutually inductive circuits. Faraday's and Lenz's laws, self-induction Seminar 10	
8		Lesson 12. Response of RC and RL circuits to impulse signals Seminar 11 Seminar 12	

9		Lesson 13. Passive filters and resonant circuits Lesson 14. Alternating current devices Seminar 13	
10		Lesson 15.Sinusoidal voltage circuits. Sequence of pulses. Response of RC and RL circuits to impulse signals. Frequency characteristic Seminar 14 Seminar 15	
11		Lesson 16. DC circuits. Voltage and current sources Lesson 17. Ammeters and voltmeters. Ohm's law. . Response of elements R, L and C to sinusoidal voltages and currents. Frequency characteristic Seminar 16	
12		Lesson 18. Circuit theorems. Maximum power transfer theorem Seminar 17 Seminar 18	
13		Lesson 19. Loading effect of voltmeters and ammeters Lesson 20. Energy stored in inductance. Inductively coupled circuit elements Seminar 19	
14		Lesson 21. Sinusoidal alternating waves. Characteristics of sinusoidal alternating current Seminar 20 Seminar 21	
15		Lesson 22. Filters. Low and high frequency RC filter Lesson 23. Series and parallel resonant circuits. Selectivity Seminar 22	

Recommended Sources

TEXTBOOK(S)

1. H.A. Mammadov, N.I. Orujov. Linear electric circuits. Textbook. Baku, Baku State University, 2021
2. SM Taghizade, SBYusifova. Fundamentals of Electrical Engineering. (Part I). Textbook for higher education institutions. Baku-2015, 268 p.
3. S. Taghizade, M. Hamidov, S. Yusifova. Fundamentals of Electrical Engineering. (Part II). Manual for higher education institutions, Baku, ASOIU, 2019
4. Fursov V.B. Theoretical foundations of electrical engineering. Theory chain. Field theory. Computer modeling. Задачи, 2024. – 436 с.
5. Atabekov G.I. Основы теории цепей: учебник / Г.И. Atabekov. – 5th ed., ster. – St. Petersburg: Lan, 2020. – 424 с.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	

Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**210**
Total Workload/30(h)	**210/30**
ECTS Credits of the Course	**7**

Computer Engineering bachelor program, Department of "Mechanics and Mathematics"

Course Unit Title	Electronics Basics
Course Unit Code	İF-B15
Type of Course Unit	Compulsory
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hours/week)	3
Practice (hours/week)	2

Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	6
Course Coordinator	Rustamova Durdana Farhad
Name of Lecturer(s)	Rustamova Durdana Farhad
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
The development in all areas of production is achieved as a result of the application of measurement, control, automatic regulation and automatic control systems in these areas, which is directly related to the widespread use of electronic devices. Electronic devices play a great role in increasing the reliability of electrical systems. Electronics has an indispensable role in the use of alternative energy sources, especially solar and wind energy. Considering all this, it is clear that studying the subject “Fundamentals of Electronics” is important.

Course Objectives:
The goal and main objective of teaching the subject is to provide future specialists with relevant knowledge about the "Fundamentals of Electronics" and to develop in them the ability to effectively use this knowledge in their work. The knowledge acquired will be significantly useful for these specialists in monitoring, maintaining, and improving the operation of electronic circuits.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Semiconductor devices and the physical processes occurring in them	1, 2
2	Diodes and transistors, physical processes occurring in them and their applications	1, 2
3	Semiconductor rectifiers. Single-phase and three-phase rectifiers. Smoothing filters	1, 2
4	Electrical signal amplifiers, their types and areas of application	1, 2
5	Harmonic oscillator generators. LC – autogenerators	1, 2
6	Pulse signal generators, triggers, multivibrators	1, 2
7	RC – autogenerators; Digital electronic and microelectronic devices	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program		
		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	4
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	4
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	3
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. General information about semiconductor materials. Specific and additive conductors Lesson 2. Carrier concentration in semiconductors Seminar 1	

2		Lesson 3.Electrical conductivity of semiconductors. Diffusion and drift currents in semiconductors Seminar 2	
3		Lesson 4. Metal-semiconductor contact. p–n junction Lesson 5. Classification of semiconductor diodes Seminar 3	
4		Lesson 6.Rectifier diodes Seminar 4	
5		Lesson 7. Bipolar transistors. Operating modes of a bipolar transistor Lesson 8. Unipolar transistors Seminar 5	
6		Lesson 9. Thyristors Seminar 6	
7		Lesson 10. Optical and photoelectric properties of semiconductors Lesson 11. Semiconductor light-emitting diodes Seminar 7	
8		Lesson 12. Technological foundations of microelectronics Seminar 8	
9		Lesson 13.Classification of integrated circuits Lesson 14. Amplifiers. Classification of amplifiers Seminar 9	
10		Lesson 15. Operational amplifiers Seminar 10	
11		Lesson 16. Electronic switch circuits. Bipolar transistor switch circuit Lesson 17. Elements of logic Seminar 11	
12		Lesson 18. Bipolar transistor logic elements Seminar 12	
13		Lesson 19. Triggers Lesson 20. Power sources for electronic devices Seminar 13	
14		Lesson 21.Single-phase rectifiers Seminar 14	
15		Lesson 22. General information about three-phase and polyphase rectifiers Lesson 23. Smoothing filters Seminar 15	

Recommended Sources

TEXTBOOK(S)

1. R.T. Humbatov. Electronics. Part I, Maarif Publishing House, Baku, 2002.
2. R.T. Humbatov. Electronics. Part II, Maarif Publishing House, Baku, 2010.
3. M.N. Yolchuyev, N.S. Akhundov. Electrical Engineering and Electronics. MBM Publishing House, Baku, 2012.
4. Yu.S. Zabrodin. Industrial electronics. Издательство "Высшая школа", Moscow, 1982.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**180**
Total Workload/30(h)	**180/30**
ECTS Credits of the Course	**6**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Digital System
Course Unit Code	İF-B16
Type of Course Unit	Compulsory
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	7
Theoretical (hours/week)	3
Practice (hours/week)	2
Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	6
Course Coordinator	Sema Bayramova Gadir
Name of Lecturer(s)	Sema Bayramova Gadir
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
To form appropriate knowledge, skills and habits in students, and to ensure their computer skills

Course Objectives:
"Digital systems""The purpose of the subject is —It is a scientific and technical direction that primarily covers the problems of analysis and synthesis of electronic devices applied in electronics, radio engineering, automation, computing technology and other fields. It serves the purpose of ensuring the correct selection and construction of electronic devices' circuits for optimal performance of the functions provided by them, and the resolution of issues related to the reporting and selection of these devices and the elements included in their composition.

Learning Outcomes

At the end of the course the student will be able to	Assessment

1	Digital systemsFormation of ideas about the goals and objectives of the discipline as a science, scientific research methods, and its relationship with other sciences	1, 2
2	For students studying at the bachelor's level, "Digital systems"Formation of ideas about the goals and objectives of the training"	1, 2
3	For students studying at the bachelor's level, "Digital systems"Performance of practical tasks used in the training of the course	1, 2
4	Monitoring and investigating the level of performance of practical tasks	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	4
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	4
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	3
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents			
Week	Chapter	Topics	Exam
1		Lesson 1. About digital information and number systems Lesson 2. Logic elements and their schematics. Basic parameters of logic integrated circuits Seminar 1	
2		Lesson 3. Raqem electron groups Seminar 2	
3		Lesson 4. Combinational number devices Lesson 5. Multiplexer, demultiplexer Seminar 3	
4		Lesson 6. Encoder, decoder Seminar 4	
5		Lesson 7. Arithmetic – Logic Devices - Adder, Comparator Lesson 8. Sequential digit devices Seminar 5	
6		Lesson 9. Registers Seminar 6	
7		Lesson 10. Pulse Counters Lesson 11. AND, OR, NOT devices Seminar 7	
8		Lesson 12. NAND, NOR devices Seminar 8	
9		Lesson 13. Semiconductor memory devices Lesson 14. RAM devices Seminar 9	
10		Lesson 15. Permanent memory devices Seminar 10	
11		Lesson 16. Trigger. Functional diagram of the device Lesson 17.D, T, DV and two-stage triggers Seminar 11	
12		Lesson 18. About the microprocessor Seminar 12	
13		Lesson 19. Microprocessors, purpose, classification Lesson 20. Interaction of the microprocessor with RES devices Seminar 13	
14		Lesson 21. Architecture of microprocessor systems Seminar 14	
15		Lesson 22. MP operation algorithm Lesson 23. MP and their interaction with the devices of technical systems	

		Seminar 15	

Recommended Sources

TEXTBOOK(S)

1. IEEE Std (Reaffirmed 2021), Graphic Symbols for Electrical and Electronic Diagrams.
2. Peter Spasov, Microcontroller Technology, The 68HC11 and 68HC12, fifth edition, copyright 2021 by Pearson Education, Inc.
3. Thomas L. Floyd Digital Fundamentals, 11th edition, ISBN 978-0-13-273796-8, published by Pearson Education 2015.
4. Mark Balch COMPLETE DIGITAL DESIGN, A Comprehensive Guide to Digital Electronics and Computer System Architecture 2003 by The McGraw-Hill Companies.
5. Ali Özdemir Digital Electronics ISBN 978-605-324-001-3, 2016, 220 pages.
6. Volnei A. Pedroni DIGITAL ELECTRONICS AND DESIGN WITH VHDL, 2008 by Elsevier Inc. All rights reserved.
7. A.H. Mammadov Microcircuitry textbook. Baku Chasioglu 2002
8. FH Mammadov, A.H. Mammadov, M.A. Mammadov Fundamentals of Circuit Engineering Textbook Part I-II Baku 2007.
9. Gusev V.G., Gusev Yu.I. Electronics: Textbook for universities. 2-ое изд., перераб и дополн. - М.: Высшая школа, 1991г. - 622 р

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**210**

Total Workload/30(h)	**210/30**
ECTS Credits of the Course	**7**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Computer System Security
Course Unit Code	İF-B17
Type of Course Unit	Compulsory
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	8
Theoretical (hours/week)	3
Practice (hours/week)	3
Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	6
Course Coordinator	Aysel Fataliyeva
Name of Lecturer(s)	Aysel Fataliyeva
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
The subject of computer systems security is devoted to the security of information technology and the privacy of information systems. This subject teaches students information about security measures and technologies to ensure the privacy, integrity and directionality of computer systems, network infrastructure, software and data.)

Course Objectives:
Computer systems security is a field dedicated to information security and information technology security. This subject provides students with practical knowledge and skills in security principles and technologies to ensure the confidentiality, integrity and integrity of information systems and data. Its goal is to transform students into information security professionals who can play a successful and active role in combating various cyber threats.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	The aim of the subject is to prepare students to become experienced and accomplished professionals in the field of information security	1, 2
2	Topics such as information security issues, attack prevention, network security, information security policies, security audits and monitoring are mainly studied	1, 2
3	This subject is responsible for providing students with the highest level of privacy and security of information technology	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various	4

	applications and devices	
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	4
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. Cyber threats and defense strategies Lesson 2. Data security standards and compliance measures Seminar 1	
2		Lesson 3. Network security and firewall technologies Seminar 2 Seminar 3	
3		Lesson 4. Information security auditing and monitoring principles Lesson 5. Principles of cryptography and encryption technologies Seminar 4	
4		Lesson 6. Biometric data and biometric identification Seminar 5 Seminar 6	
5		Lesson 7. Security and risks of cloud databases Lesson 8. Change management and security Seminar 7	
6		Lesson 9. Introduction to Computer Security: Overview of the fundamental principles, concepts, and objectives of computer security Seminar 8 Seminar 9	
7		Lesson 10. Threat Landscape Analysis Lesson 11. Risk Management in Computer Security Seminar 10	
8		Lesson 12. Cryptography and Encryption Seminar 11	

		Seminar 12	
9		Lesson 13. Network Security Fundamentals Web Application Security Lesson 14. Endpoint Security Seminar 13	
10		Lesson 15. Access Control and Authentication Seminar 14 Seminar 15	
11		Lesson 16. Security Policies and Procedures Lesson 17. Security Policies and Procedures Seminar 16	
12		Lesson 18. Incident Response and Forensics Seminar 17 Seminar 18	
13		Lesson 19. Security Awareness and Training Lesson 20. Cloud Security Seminar 19	
14		Lesson 21. Mobile Security Seminar 20 Seminar 21	
15		Lesson 22. Insider Threat Detection Lesson 23. Emerging Threats and Technologies Seminar 22	

Recommended Sources

TEXTBOOK(S)

1. "Computer Security: Principles and Practice", William Stallings & Lawrie Brown
2. Cybersecurity and Cyberwar: What Everyone Needs to Know, Allan Friedman, PW Singer
3. "Network Security Essentials: Applications and Standards",William Stallings

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria Final grades are determined according to the Academic Regulations of WCU	
Course Policies • Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations	
ECTS allocated based on Student Workload	
Total Workload	**240**
Total Workload/30(h)	**240/30**
ECTS Credits of the Course	**8**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Computer Graphics
Course Unit Code	İF-B18
Type of Course Unit	Compulsory
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hours/week)	2
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	5
Course Coordinator	Aliyev Goshgar Seyfulla oglu

Name of Lecturer(s)	Aliyev Goshgar Seyfulla oglu
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

Working with computer graphics is one of the most common areas of using a personal computer."Computer graphics"The training course is designed for computer owners who are trying to master the capabilities of modern computer graphics, as well as advertising, designer, and public relations specialists who are able to work at a beginner level on a personal computer. "Computer graphicsThe purpose of teaching the subject "Computer Graphics and Multimedia" is to provide students with detailed information about the currently available computer graphics and multimedia tools, their development history and directions, as well as their application areas, and to instill in them the skills to use computer graphics and multimedia tools in practice. : Students who receive bachelor's education in the specialty "Computer Engineering" and "Information Technology Engineering" must be able to use computer graphics and multimedia tools. Graduates of this specialty are mainly engaged in research and scientific-practical work in areas where information and communication technologies are used.

Course Objectives:

In the teaching of the subject, students are provided with detailed information about the basic concepts and types of computer graphics, solutions for various devices and images, computer representation of graphic information, various types of computer graphics and multimedia tools, encoding of graphic images, various color models, requirements for choosing a color rendering model, graphic file formats, equipment intended for working with images and requirements for their selection, simple and professional multimedia technologies and their capabilities, application areas and features.The main goal of the subject being taught is to assist students in their independent work and to increase the effectiveness of their mastery of the subject.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about the basic concepts and types of computer graphics	1, 2
2	Formation of the necessary knowledge and skills about various devices and image solutions	1, 2
3	Formation of ideas about various types of computer graphics and multimedia tools	1, 2
4	Formation of the ability to apply various color models and color rendering models	1, 2
5	Formation of ideas about the equipment intended for working with images and the requirements for their selection	1, 2

6	Formation of the ability to use simple and professional multimedia technologies	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	4
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	3
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	4
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	5
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	4
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. Computer graphicsBasics of. Types of computer graphics and their characteristics. Basic elements of computer graphics Seminar 1	

2		Lesson 2.Advantages and disadvantages of raster and vector graphics	
3		Lesson 3. Computer graphicsGeneral classification of graphics programs used in. Similar and different features of different types of computer graphics Seminar 2	
4		Lesson 4. Classification and purpose of modern graphic editors and programs.Application areas.The concept of pixels. Simple and complex vector objects	
5		Lesson 5. Adobe Photoshop: Purpose and capabilities of the program Seminar 3	
6		Lesson 6. Graphic file formats. Overview of image file types. Classification of basic formats. Areas of application and main features of various formats	
7		Lesson 7. Layers and color channels in Adobe Photoshop Adobe Photoshop toolbar and effects Seminar 4	
8		Lesson 8. Color models. Additive and subtractive color models. Color manager. Primary, secondary, and derived colors. Additive color model - RGB. Subtractive color model - CMYK. Indexed color. Lab color. Grayscale images. Images in bitmap mode. Color balance	
9		Lesson 9. Creating collages and montages in Adobe Photoshop Seminar 5	
10		Lesson 10. CorelDraw: Toolbar and effects menu. . Corel Draw: Creating vector objects	
11		Lesson 11. CorelDraw vector graphics program. Purpose and capabilities of the program Seminar 6	
12		Lesson 12. CorelDraw: Creating simple and complex shapes	
13		Lesson 13. CorelDraw: transition from raster graphics to vector graphics. Corel Draw: Special effects. Transition of objects from one form to another Seminar 7	
14		Lesson 14. CorelDraw: Working with text. Formatting and editing text	
15		Lesson 15. CorelDraw: Editing the color fill and outline of an object. Corel Draw: Palette. Fills. Shaped text and plain text. Application areas Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. Hajiyeva R.C. Informatics. Collection of lectures, Polygraphic and Publishing Center of the State University of Baku, Baku, 2020, 180 p.
2. Adobe Photoshop Classroom in a Book (2023 release) By Conrad Chavez. Published Dec 6, 2022 by Adobe Press.
3. Seyidzade E.V., Alizade M.N. Corel DRAW 12. Textbook "MSV PUBLICATION". Baku, 2006, 280 pages.
4. Faulkner, Chavez: Adobe Photoshop CC. Official course. Exmo-Press, 2021. 448 c.
5. Toporkov C. Adobe Photoshop CS in examples, изд-во «БХВ-Петербург», 2005, 384 стр.
6. CorelDRAW 2020 tutorial / H.B. Komolova, E. C. Yakovleva. — СПб.: БХВ-Петербург, 2021. — 416 с.
7. A.S. Rukavishnikova. "Technical drawing in CorelDRAW", 2023. - 257 str. 262 illustrations

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**150**
Total Workload/30(h)	**150/30**
ECTS Credits of the Course	**5**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Computer Modeling
Course Unit Code	İF-B19
Type of Course Unit	Compulsory
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	7
Theoretical (hours/week)	3
Practice (hours/week)	3
Laboratory (hours/week)	
Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Sema Bayramova Gadir
Name of Lecturer(s)	Sema Bayramova Gadir
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-
Course description: (A brief description of the subject, the purpose of teaching the subject, and the methods to be applied in teaching the subject are explained in writing. What students will know, what they will achieve, and what skills they will acquire by studying this subject are noted.) Computer modeling is used to solve many problems. Computer modeling is widely used in science, business, etc. fields, making a person's professional opportunities endless.	
Course Objectives: Ensuring the scientific and methodological preparation of future specialists, forming in them the relevant knowledge, skills and habits for implementing teaching, introducing them to the experience gained in teaching the subject of computer modeling, and forming the ability to think logically.	

Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Formation of ideas about the goals and objectives of the subject of "Computer Modeling" as a science, scientific research methods, and its relationship with other sciences	1, 2
2	Formation of ideas about the forms of application of the subject "Computer Modeling"	1, 2
3	Formation of ideas about "computer modeling" tools	1, 2
4	Formation of ideas about the principles and teaching methods of the subject "Computer Modeling"	1, 2
5	Formation of ideas about the goals and objectives of the subject "Computer Modeling" among undergraduate students	1, 2
6	Completion of practical tasks used in the subject "Computer Modeling" by undergraduate students	1, 2
7	Monitoring and investigating the level of performance of practical tasks	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	5
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	4

8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. Computer modeling as a method of scientific cognition. Modeling methods Lesson 2. Advantages of computational experimentation Model and modeling concepts Seminar 1	
2		Lesson 3. Model characteristics. Goals of modeling Seminar 2 Seminar 3	
3		Lesson 4. Classification of models Lesson 5. Classification of information models Seminar 4	
4		Lesson 6. Development of graph information model problems Seminar 5 Seminar 6	
5		Lesson 7. Modelingand systematic approach Lesson 8. Principles of computer modeling. Relationship with other methods of knowledge.Life cycle and applications of the modeled system Seminar 7	
6		Lesson 9. Classification scheme of a mathematical model according to hierarchical level and the nature of the described properties of the object Seminar 8 Seminar 9	
7		Lesson 10. Architectural scheme of an economic model. Classification of knowledge models Lesson 11. Isimulation modeling of production systems Seminar 10	
8		Lesson 12. Architecture of a complex system simulation model Seminar 11	

		Seminar 12	
9		Lesson 13. Computer graphics Lesson 14. Using software packages for modeling technical systems Seminar 13	
10		Lesson 15. Application areas of computer modelsMonte Carlo method Seminar 14 Seminar 15	
11		Lesson 16. Corel Draw tutorials - introduction Lesson 17. Corel Draw lessons - using the panel Seminar 16	
12		Lesson 18. Corel Draw tutorials-tools panel Seminar 17 Seminar 18	
13		Lesson 19. Corel Draw tutorials-text-tool-paragraph tool Lesson 20. Corel Draw tutorials - create business card Seminar 19	
14		Lesson 21. Corel Draw tutorials - shortcuts Seminar 20 Seminar 21	
15		Lesson 22. Corel Draw tutorials - drop shadow, contour Lesson 23. Corel Draw lessons - artistic media tool Seminar 22	

Recommended Sources

TEXTBOOK(S)

1. McGraw-Hill Publishing Co. ISBN: 0071255192. (2023): Simulation Modeling and Analysis (An outstanding reference for simulation students and researchers)
2. Ahmadov MA, Mahammadli HM Methods of automated modeling and research of information systems. Sumgayit, 2015, 135 p.
3. Alizade AN, Namazov MB, Aslanov MS Matlab application package and symbolic mathematics. Textbook. Baku, 2005, 280 p.
4. Mamedov J.F. Magamedli H.M. Modeling of GPM in the form of finite automata and research by analysis of the main properties of the Petri net / Proceedings of the XVI International Open Conference "Modern problems of informatization in modeling and social technologies". вып.16, Voronezh: Научная книга, 2011, p.260-264.
5. Mammadov H.A., Rustamov G.A., Rustamov R.G. Engineering mathematics. Textbook, AzTU, -2015, -440 p.
6. Rustamov G.A. Theory of automatic regulation. Modeling in Matlab Simulink. Baku, 2012, 750 p.
7. Sadigov Z.A., Mahammadli HM Algorithm for transformation of input information described by production models into a Petri net. / Proceedings of the sixth International Scientific and Technical Conference "Microelectronic converters and devices based on them". Baku-Sumgait, 2002, pp. 155-156

Assessment		
Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**210**
Total Workload/30(h)	**210/30**
ECTS Credits of the Course	**7**

Computer Engineering bachelor program, Department of "Ecology and Environment"

Course Unit Title	Civil Defense
Course Unit Code	İF-B20
Type of Course Unit	Compulsory
Level of Course Unit	1st year
National Credits	

Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	1
Semester when the course unit is delivered	1
Course Coordinator	Amrahov Elshan Shirin
Name of Lecturer(s)	Amrahov Elshan Shirin
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-

Course description:

As a sovereign state, Azerbaijan solves all security problems on its own, therefore, when developing our security doctrine, two important aspects should be taken into account.

First, we must remember how many nuclear arsenals exist, their threat to this or that country must be taken into account, and this factor must be taken into account in protection programs.

Secondly, we must not forget that our country borders on states that possess nuclear weapons or have nuclear munitions stored on their territory. Therefore, when planning and implementing Civil Defense (CD) measures, attention should not be reduced to protecting the population, as well as national economic facilities, from weapons of mass destruction (WMD). The protection system faces the problem of protection from man-made and natural disasters.

Course Objectives:

Civil Defense (CD) is the science of protecting human safety and health in the environment. It should identify and define dangerous and harmful factors, study methods and means of human protection, ways to minimize harmful and dangerous factors, and develop measures to eliminate the consequences of accidents and disasters occurring in peacetime and wartime.

Emergency events that cause large material losses and human casualties (accidents at nuclear power plants, railways, enterprises using highly reactive substances, and frequent natural disasters, etc.) show that the MM measures, especially for emergencies of peace origin, should be reviewed and evaluated. This issue is of greater importance in market relations and in the transition period.

Civil defense of the Republic of Azerbaijan is a system of measures implemented by state authorities, legal entities and individuals to ensure the security of the population and its territory during peace and war.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about the teaching methodology, goals and objectives, scientific and research methods, and relationship with other sciences of the Civil Defense subject;	1, 2
2	Formation of ideas about the means of training in Civil Defense;	1, 2
3	Formation of ideas about the forms of organizing civil-defense training;	1, 2
4	Formation of ideas about the goals and objectives of the teaching methodology of Civil - Defense, scientific research methods, and its relationship with other sciences;	1, 2
5	Formation of ideas about the forms of organizing MM training	1, 2
6	Formation of ideas about the principles and training methods of MM training;	1, 2
7	Formation of the ability to make logical judgments, draw conclusions and justify them.	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	2
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	2
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	2
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	2
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	2
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the	5

	impact of engineering decisions in various fields	
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1. The concept of civil defense, its history, role, duties andEmergency from events defense in the field population preparation organization. Civil Defensedissemination of knowledge	
2		Seminar 1	
3		Lecture 2. Classification of emergencies	
4		Seminar 2	
5		Lecture 3. Understanding weapons of mass destruction. Nuclear weapons and their damaging factors. Conventional means of destruction	
6		Seminar 3	
7		Lecture 4. Basic characteristics of radiation chemical reconnaissance and dosimetric devices and rules for their use	
8		Seminar 4	
9		Lecture 5. Rules for the use of personal protective equipment in emergency situations	
10		Seminar 5	
11		Lecture 6. Basic principles and methods of population protection in emergency situations.Collective protection devices	
12		Seminar 6	
13		Lecture 7. Emergency evacuation of the population	
14		Seminar 7	
15		Lecture 8. Carrying out rescue and other urgent (Emergency and Disaster Management) work	

Recommended Sources

TEXTBOOK(S)

1. R.Guliyev, O. Salayev, J. Dadashov, T. Hamzabeyova “Civil Defense” Baku – 2022
2. Methods and tactics for fighting wildfires. EuroFire © September 2008
3. Album of schemes on the subject of "Civil Defense" Baku-2019
4. Basic Safety Rules. Ministry of Emergency Situations Baku-2016
5. Tural Amirkhanle. Primary fire extinguishing means. Baku 2004

6. Malik Abbasov, Shamil Guliyev. First aid. Baku 2017
7. Urgent first aid. Ministry of Emergency Situations Baku-2015
8. Ojagov HOSafety of life in emergency situations. Baku 2010
9. NMHajyyev SHMahmudov. Civil defense in the agricultural sector. Ganja - 2012
10. Ojagov HO Elimination of the consequences of emergency situations. Baku, 2009.
11. Ojagov HO Safety of life activities in emergency situations (Textbook for higher education institutions). Chasioglu, Baku, 2002
12. Ojagov HO Civil defense protection facilities. 1993
13. Ojagov HO Safety of life in emergencies (Civil defense). Baku, 2002
14. Ojagov HO Civil defense protection devices. Baku, 2003
15. Ojagov HO Emergency Management. Baku, 2008
16. Ojagov HO, Danyalov Sh.D. Theoretical foundations of life safety. Baku, 2008
17. "Civil Defense". Karimov Officer Samad Baku 2013
18. Karimov ZS Safety of life activities, labor protection. Baku, 2016
19. R.Guliyev, O.Salayev, J.Dadashov, T. Hamzabeyova Civil defense Baku, 2022
20. Head of the Academy of the Ministry of Emergency Situations of the Republic of Azerbaijan Major General Baba Salayev, Colonel Ilham Babashov, Lieutenant Colonel Rafael Mustafayev "The Book of the Rescuer" Baku, 2021

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**90**

Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Fundamentals of circuit engineering
Course Unit Code	ATMF-BO1
Type of Course Unit	Elective
Level of Course Unit	1st year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	2
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	1
Semester when the course unit is delivered	2
Course Coordinator	Sema Bayramova Gadir
Name of Lecturer(s)	Sema Bayramova Gadir
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-
Course description: To form appropriate knowledge, skills and habits in students, and to ensure their preparation for working with computers.	

Course Objectives:

The purpose of the subject "Fundamentals of Circuit Engineering" - Circuit engineering is a scientific and technical direction that covers the problems of analysis and synthesis of electronic devices applied in many fields of technology, primarily in electronics, radio engineering, automation, computing and other fields. It serves the purpose of ensuring the correct selection and construction of electronic devices' circuits for optimal performance of the functions provided by them, and the resolution of issues of reporting and selection of these devices and the elements included in their composition.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about the goals and objectives of the subject of fundamentals of circuit engineering as a science, scientific research methods, and its relationship with other sciences	1, 2
2	Formation of ideas about the goals and objectives of the "Fundamentals of Circuit Engineering" training for undergraduate students	1, 2
3	Completion of practical tasks used in the training of the "Fundamentals of Circuit Engineering" course for undergraduate students	1, 2
4	Monitoring and investigating the level of performance of practical tasks	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3

8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	4
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1. Introduction to the basics of circuit engineering. Basic concepts. Characteristics, types and marking of digital devices	
2		Logical constants and variables. Operations of Boolean algebra. The duality principle in logical operations Seminar 1	
3		Lecture 2. Methods of describing logic variables by electrical signals. Classification of basic ME	
4		Widely used basic logic chips Seminar 2	
5		Lecture 3. Combinational digital devices. Typical functional diagrams of combinational digital devices	
6		Multiplexer and demultiplexer Seminar 3	
7		Lecture 4. Registers. Counters	
8		Edcoder and decoder Seminar 4	
9		Lecture 5. Triggers	
10		Consolidators Seminar 5	
11		Lecture 6. Comparators	
12		Microprocessors, their purpose, classification and their interaction with the devices of technical systems Seminar 6	

13		Interaction of the microprocessor with RES devices Seminar 7	
14		Lecture 7. Architecture of microprocessor systems	
15		Lecture 8. MP working algorithm Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. IEEE Std (Reaffirmed 2021), Graphic Symbols for Electrical and Electronic Diagrams.
2. Peter Spasov, Microcontroller Technology, The 68HC11 and 68HC12, fifth edition, copyright 2021 by Pearson Education, Inc.
3. Thomas L. Floyd Digital Fundamentals, 11th edition, ISBN 978-0-13-273796-8, published by Pearson Education 2015.
4. Mark Balch COMPLETE DIGITAL DESIGN, A Comprehensive Guide to Digital Electronics and Computer System Architecture 2003 by The McGraw-Hill Companies.
5. Ali Özdemir Digital Electronics ISBN 978-605-324-001-3, 2016, 220 pages.
6. Volnei A. Pedroni DIGITAL ELECTRONICS AND DESIGN WITH VHDL, 2008 by Elsevier Inc. All rights reserved.
7. A.H. Mammadov Microcircuitry textbook. Baku Chasioglu 2002
8. FHMammadov, A.H.Mammadov, M.A.Mammadov Fundamentals of Circuit Engineering Textbook Part I-II Baku 2007.
9. Gusev V.G., Gusev Yu.I. Electronics: Textbook for universities. 2-ое изд., перераб и дополн. - M.: Высшая школа, 1991г. - 622 p.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies • Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations	
ECTS allocated based on Student Workload	
Total Workload	**120**
Total Workload/30(h)	**120/30**
ECTS Credits of the Course	**4**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Systems Analysis
Course Unit Code	ATMF-BO1
Type of Course Unit	Elective
Level of Course Unit	1st year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	2
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	1
Semester when the course unit is delivered	2
Course Coordinator	Ahmadova Esmira Nariman
Name of Lecturer(s)	Ahmadova Esmira Nariman
Name of Assistant(s)	-

Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

""Systems analysis" is a scientific and methodological discipline that studies the methods, tools, and principles of describing complex objects as systems and analyzing these systems. Systems analysis is a set of concepts, methods, and technologies for studying, describing, and creating various systems (processes and phenomena).

Course Objectives:

The purpose of the subject "Systems Analysis" is to study the role, characteristics, principles, stages, and methods of system modeling of systemic analysis and systemic approach in solving management problems.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about the purpose, subject and basic concepts of the subject	1, 2
2	Formation of ideas about systems analysis	1, 2
3	Formation of ideas about the systematic approach, its essence and principles	1, 2
4	Formation of ideas about the features of a systematic approach in solving management problems	1, 2
5	Formation of ideas about modeling	1, 2
6	Formation of ideas about building a system model	1, 2
7	Formation of ideas about computer modeling, stages, and instrumental tools	1, 2
8	requirements analysis and initial system design concepts	1, 2
9	Formation of ideas about the application of situation modeling in decision-making	1, 2
10	Formation of the ability to describe simple objects as systems	1, 2
11	Formation of the ability to classify objects according to various characteristics	1, 2
12	Formation of the ability to conduct system analysis of simple systems	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5

2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1.The purpose, subject and basic concepts of the subject	
2		System analysis Seminar 1	
3		Lecture 2.Systematic approach, its essence and principles	
4		A systematic approach to studying and improving complex systems. Seminar 2	
5		Lecture 3.Stages of systematic analysis in solving management problems	

6		Modeling Seminar 3	
7		Lecture 4.Types of modeling	
8		Information modeling Seminar 4	
9		Lecture 5.Classification of information models	
10		The main stage of systematic analysis is building a model of the object under study. Seminar 5	
11		Lecture 6.Computer modeling, stages, instrumental tools	
12		Mathematical modeling Seminar 6	
13		Lecture 7.Modeling problems	
14		Modeling a system under uncertainty Seminar 7	
15		Requirements analysis and preliminary system design Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. Karimov SQ Information systems. - Baku: Elm, 2008, 676 p. Sardarov YB Mathematical elements of informatics and computing techniques /Textbook/. - Baku, 2006. - 102 p.
2. Bakhvalov L. Types of modeling. Computer modeling. http://bourabai.kz/cm/bahvalov2.htm
3. Gubanov V.A., Zakharov V.V., Kovalenko A.N. Introduction to system analysis. L.: Изд-во Ленинградского ун-та, 1988. 232 с.
4. Prokhorov Yu.K., Frolov V.V. Management decisions. С.Пт – 2011.
5. Safronov V. System analysis.Electronic textbook: http://victor-safronov.ru/systems-analysis/lectures/kaziev.html
6. Ю.Ю. Gromov, N.A. Zemskoi, A.V. Lagutin and others. System analysis in information technologies. Учеб. allowance. Tambov: Изд-во Тамб. Gos. technical University, 2004. 176 str.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	

Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**120**
Total Workload/30(h)	**120/30**
ECTS Credits of the Course	**4**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Computer Diagnostics
Course Unit Code	ATMF-BO2
Type of Course Unit	Elective
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	2
Practice (hours/week)	1
Laboratory (hours/week)	

Year of Study	2
Semester when the course unit is delivered	3
Course Coordinator	Atayev Gafar Nariman
Name of Lecturer(s)	Atayev Gafar Nariman
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

The course on the basics of information technology covers the functional-structural organization of a personal computer, information management device, information display device, and is intended to teach students important concepts and basic knowledge. The course consists of theoretical and seminar lessons. It includes sections on the description and explanation of all technical concepts, their application, and their use in modern times.

Course Objectives:

The course "Computer Diagnostics" covers the functional-structural organization of a personal computer, information management device, information display device, and is intended to teach students important concepts and basic knowledge. The course consists of theoretical and seminar lessons. It includes sections on the description and explanation of all technical concepts, their application, and modern use.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about computer devices and their purpose	1, 2
2	Formation of ideas about computer software	1, 2
3	Formation of ideas about the Windows operating system and the ability to use it	1, 2
4	Formation of ideas about MS Word and skills in its use	1, 2
5	Formation of ideas about the Power Point electronic presentation program and the ability to use it	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL

1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	4
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	3
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents

Week	Chapter	Topics	Exam
1		The purpose and objectives of the computer diagnostics and repair subject Seminar 1	
2		Lecture 1.Concept of information, coding of information, information units	
3		The history of the creation of electronic calculating machines, generations Seminar 2	

4		Lecture 2.Architecture of modern computers	
5		Components of a personal computer (main devices) Seminar 3	
6		Lecture 3.The main elements of the computer system unit	
7		Placing computer components on the motherboard Seminar 4	
8		Lecture 4.An electronic board designed for compatibility and control of peripheral devices connected to computers	
9		The main function of the BIOS program Seminar 5	
10		Lecture 5.A complete set of personal computer hardware	
11		Test program when starting a computer session Seminar 6	
12		Lecture 6.Classification and elimination of computer problems	
13		Hard disk (hard drive) diagnostics and troubleshooting Seminar 7	
14		Lecture 8.Troubleshooting in a Windows environment	
15		Finding viruses in the MS-DOS environment Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. Hajiyeva R.C. Informatics. Collection of lectures, Polygraphic and Publishing Center of the State University of Baku, Baku, 2020, 180 p.
2. V.A. Mustafayev, Sh.S. Huseynzade, MNSalmanova. Informatics. Baku, 2014.
3. Shirokova A. I., Pyshniak M. Informatics. Разработка программ на языке программирования Piton, M., 2020, 144 p.
4. Alizade M.N., Orujova T.V., Hasanova N.A. Information security. Baku, "MSV Publishing", 2018, 388 p.
5. Alizadeh M.N., Gurbanov B.A., Hajizadeh SM Computer Graphics (Lecture materials and tests) Baku "Sada" publishing house, 2010, 544 p.
6. Savelyeva, A.Ya. Fundamentals of computer science, Учебник для ВУЗов. -Moscow.: Просвещение. 2010.
7. S.Q. Karimov, SBHabibullayev, T.I.Ibrahimzade. Informatics. Textbook for higher education institutions Baku, 2009.
8. Informatics for economists. Учебник для бачалериата и специалитета / ed. Poliakov V. P. M.: Yurayt, 2019. 524 c.
9. Nabiullina S.N. Informatics and ICT. Course lecture. M.: Lan, 2019. 72 p.
10. Gasumova S.E. Social informatics. Textbook and practice for universities. M.: Yurayt, 2019. 284 c.
11. V.B. Muslimov, MM Mehdiyev. Informatics. Baku, 2013.
12. M.S. Khalilov. Informatics. Baku, 2010.
13. S.Q.Karimov, S.B.Habibullayev, T.I.Ibrahimzade Informatics. Textbook for higher education institutions. Baku, 2011.
14. Gurbanov A.I., Abdullayeva RA Fundamentals of computer technology. Baku, 2012.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload	
Total Workload	**120**
Total Workload/30(h)	**120/30**
ECTS Credits of the Course	**4**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Decision Support Systems
Course Unit Code	ATMF-BO2
Type of Course Unit	Elective
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	2
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	2
Semester when the course unit is delivered	3
Course Coordinator	Bahar Huseynaga Askerova
Name of Lecturer(s)	Bahar Huseynaga Askerova
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
"Decision-making systems" scienceTo impart practical knowledge and principles of decision-making systems (DMS), their general characteristics, concepts, importance, areas of use, architecture, working principles and components of DMS, and their creation.teaches.

Course Objectives:
Ensuring the scientific and methodological preparation of future specialists (goals and content of Decision-Making Systems training, forms of training organization, methods and tools, modern training technologies), forming in them the relevant knowledge, skills and habits for implementing training, familiarizing them with the experience gained in teaching the subject "Decision-Making Systems", forming the ability to think logically

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about the goals and objectives of the subject "Decision-making systems" as a science, scientific research methods, and its relationship with other sciences;	1, 2
2	Formation of ideas about the forms of organizing the "Decision-making systems" training;	1, 2
3	Formation of ideas about the tools of "Decision-making systems" training;	1, 2
4	Formation of ideas about the principles and training methods of "Decision-making systems" training;	1, 2
5	To form an understanding of the goals and objectives of Decision Making Systems training for undergraduate students;	1, 2
6	Performing practical tasks used in the training of the "Decision Making Systems" course for undergraduate students	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4

6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	4
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	4
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1.Introduction to the basics of decision making. Subject matter. Basic concepts. Classification of management decisions	
2		Principles and methods of the decision-making process. Decision-making process. Basic principles and stages of the decision-making process. Methods of decision-making Seminar 1	
3		Decision-making models in management. Basic models of management decision-making and forms of implementation Seminar 2	
4		Lecture 2. Foundations of the Decision-making systems. Basic concepts. History of the emergence and development of decision support systems	
5		Architecture of the Decision-making systems. Decision-making systems based on a two-tier data warehouse. Decision-making systems based on a three-tier data warehouse. Stages of building a Decision-making systems Seminar 3	
6		Database-based Decision-making systems. Basic features of a database. Differences between a database and a data warehouse Seminar 4	

7		Lecture 3.Problems arising in analytical processing of data in the Decision-making systems based on the database	
8		Data warehouse-based Decision-making systems Seminar 5	
9		Lecture 4.Data warehouse concept. Organization of work processes in a data warehouse-based Decision-making systems	
10		Lecture 5.Data operations. Data extraction, transformation and loading into the warehouse. Methods of organizing the ETL process. ETL process development	
11		Decision-making systems Data analysis in VA. Data analytics email in VA. Classification and regression problems Seminar 6	
12		Lecture 6. Detection of anomalies and deviations from general patterns. Forecasting. Visualization	
13		Lecture 7. Areas of application of the QGS. Business. Telecommunications and Internet. Technologies. Banking. Insurance business	
14		Methods and tools for data analysis. Stages of intellectual analysis. Fuzzy logic.Neural networks. Genetic algorithms Seminar 7	
15		Lecture 8. COM, OLE and ActiveX technologies. Implementation of COM, OLE and ActiveX technologies in the POLYANALYST system Introduction to the basics of decision making Introduction. Subject of the subject. Basic concepts. Classification of management decisions	

Recommended Sources

TEXTBOOK(S)

1. Prokhorov Yu.K., Frolov V.V. Management decisions. С.Пт – 2017
2. Basics of making a management decision.
3. http://psyera.ru/Osnovy–prinyatiya–upravlencheskogo–resheniya–353.htm
4. Sergey Korneev. Decision support systems in business
5. http://www.sib.com.ua/archiv–2005/6–2005/systems/systems.htm
5. Lecture; A comprehensive approach to implementing Data Mining, OLAR and data storage in SPPR http://www.intuit.ru/department/database/datamining/17/datamining–17.html
6. Brief history of the development of system support for the adoption of decisions http://corportal.ru/History/DataTech/DSS/DSS.aspx
7. Karimov SQ Information systems.-Baku: Elm, 2008
6. Karimov SQ Management information technologies and corporate information systems. Textbook – Baku: ADNA, 2010
7. Kopneev V.V., Gareev A.F., Vasyutin S.V., Raikh V.V. Database. Intelligent information processing.

M: Haluj, 2018.
8. Karimov SQ, Karimova GS Organization and modeling of the ETL process in a data warehouse //News of ANAS, volume XXXI – Problems of Informatics and Management, No. 6, 2011, pp. 20-26.
9. Kerimov S.G. Metadata in information systems// Information technologies, No. 5, 2003, p. 37-42

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**120**
Total Workload/30(h)	**120/30**
ECTS Credits of the Course	**4**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Programming Technologies
Course Unit Code	ATMF-BO3

Type of Course Unit	Elective
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hours/week)	2
Practice (hours/week)	2
Laboratory (hours/week)	
Year of Study	2
Semester when the course unit is delivered	4
Course Coordinator	Elvin Gurbanov Shahin
Name of Lecturer(s)	Elvin Gurbanov Shahin
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

The aim of the Programming Technologies course is to teach students the fundamental principles of programming and to familiarize them with modern programming languages. The course explains various programming tools and methods through practical examples. Students enhance their analytical thinking and creative skills by applying efficient approaches to solving real-world problems. This knowledge lays the groundwork for their success in various technological fields. Ultimately, the course is designed to cultivate programmers who can develop competitive and innovative solutions

Course Objectives:

Programming Technologies is designed to introduce students to the core concepts and practices of modern programming. The course covers various programming languages, development environments, and tools while emphasizing both theoretical foundations and practical applications. Students will engage in hands-on projects that involve designing, implementing, and optimizing software solutions for real-world problems. In addition, the course fosters analytical thinking, creative problem-solving, and collaboration, all of which are essential for a successful career in software development. Ethical conduct and academic integrity are also emphasized to prepare students for professional practice

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Master fundamental programming concepts and methodologies	1, 2

2	Develop proficiency in one or more modern programming languages through practical exercises	1, 2
3	Design, implement, test, and optimize software solutions addressing real-world challenges	1, 2
4	Analyze algorithms and data structures to improve program efficiency	1, 2
5	Collaborate effectively in team projects and communicate technical ideas clearly	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	4
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents			
Week	Chapter	Topics	Exam
1		**1: The Essence of Programming** • Introduction to the fundamentals of programming. • Simple Javascript program: displaying text, executing and pausing output. Seminar 1	
2		**2: Version Control Systems** • Introduction to Git: commands, branches, merges, workflows. • Collaborative software development using GitHub or GitLab. Seminar 2	
3		**3: Variables** • Data types: strings, integers, booleans, undefined, and null. • Arithmetic operations, assignment operators, and their priorities. Seminar 3	
4		**4: Conditional Operators** • Conditional operations: if-else, complex conditions, switch statements Seminar 4	
5		**5: Loops** • Loop constructs: for, while, and do-while loops. Seminar 5	
6		**6: Arrays and Matrices** Introduction to arrays and matrices: declaration, manipulation, and use in JavaScript. Seminar 6	
7		**7: Objects** • Basics of objects in JavaScript: definitions, properties, and methods. Seminar 7	
8		**8: Functions and Procedures** • Principles, definitions, and usage of functions and procedures in JavaScript Seminar 8	
9		**9: Programming Paradigms** • Programming paradigms: Imperative, Functional, Object-Oriented, and Logical Programming. Seminar 9	

10		**10: Software Development Life Cycles (SDLC)** • Overview of SDLC models: Waterfall, Agile, Scrum, DevOps. • Best practices in software development. Seminar 10	
11		**11: Basics of Web Development** • HTML and CSS: Building a simple static website. Seminar 11	
12		**12: Advanced Web Development** • Enhancing static websites with SASS and JavaScript. Introduction to RESTful APIs and handling HTTP requests with Fetch API and Axios. Seminar 12	
13		**13: Client-Side Frameworks and Libraries** • Overview of JavaScript frameworks: React, Angular, Vue.js. • Building a small application using a client-side framework. Seminar 13	
14		**14: React Hooks** • General information about Hooks. • useState • useEffect • useContext Hook Seminar 14	
15		**15: State Management with React.js** • State and Props in React.js. • Managing state through the Context API Seminar 15	

Recommended Sources

TEXTBOOK(S)

1. Kernighan, BW, & Ritchie, DM – The C Programming Language (2nd Edition)
2. A foundational text introducing the principles of the C programming language and structured programming.
3. Aho, AV, Lam, MS, Sethi, R., & Ullman, JD – Compilers: Principles, Techniques, and Tools
4. An in-depth look at compiler design, language analysis, and algorithm construction.
5. Zelle, J. – Python Programming: An Introduction to Computer Science
6. An accessible introduction to programming concepts using Python as the medium.
7. Cormen, TH, Leiserson, CE, Rivest, RL, & Stein, C. – Introduction to Algorithms A comprehensive guide to algorithm design and analysis.

Assessment

Attendance	10%	At least 75% class attendance is compulsory

Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**150**
Total Workload/30(h)	**150/30**
ECTS Credits of the Course	**5**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Application Software Suite
Course Unit Code	ATMF-BO3
Type of Course Unit	Elective
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hours/week)	2

Practice (hours/week)	2
Laboratory (hours/week)	
Year of Study	2
Semester when the course unit is delivered	4
Course Coordinator	Ahmadova Esmira Nariman
Name of Lecturer(s)	Ahmadova Esmira Nariman
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

"Application software package" is about application programs, which constitute an important part of the subject software, their features and usage.covers topics. Among these topics are "Software system", "Application software composition", "Mathematical software packages", etc. topics.

Course Objectives:

Application software packageThe purpose of the subject is to form a worldview, relevant knowledge and skills about applied programs, their characteristics and applications.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Application software contentand forming ideas about opportunities	1, 2
2	Using application programs in organizing and researching various modelsformation of ideas and skills about	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4

3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	4
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents

Week	Chapter	Topics	Exam
1		Software system Seminar 1	
2		Application software content Seminar 2	
3		Modeling tools Seminar 3	
4		Using application programs in organizing and researching various models Seminar 4	
5		Mathematical software packages Seminar 5	

6		Main capabilities of the Matlab application package Seminar 6	
7		Calculations and graphs in Matlab Seminar 7	
8		General purpose application software packages Seminar 8	
9		Method-oriented application software packages Seminar 9	
10		Problem-oriented application software packages Seminar 10	
11		MS Office software package Seminar 11	
12		TPP of global computer networks Seminar 12	
13		Database management systems Seminar 13	
14		Geographic information systems Seminar 14	
15		Expert systems Seminar 15	

Recommended Sources

TEXTBOOK(S)

1. Trofimov V. B. Informatics. Textbook for academic bachelor's degree. In 2 volumes. Volume 2. M.: Jurayt, 2019. 406p.
2. Filimonova E. B. Informatics and information technologies in professional activity. Textbook. M.: Justitia, 2019. 216 c.
3. Karimov SQ Habibullayev SB Ibrahimzade T.I. "Informatics". Baku. 2011.
4. Mammadov H.A., Rustamov G.A., Rustamov R.G. Engineering Mathematics. Baku-2015.
5. Gurbanov I.A., Gurbanov A.I. “Mathematical software packages”. Baku, 2015, 168 p.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	

Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**150**
Total Workload/30(h)	**150/30**
ECTS Credits of the Course	**5**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Algorithmization and Programming
Course Unit Code	ATMF-BO4
Type of Course Unit	
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	1
Practice (hours/week)	
Laboratory (hours/week)	1

Year of Study	2
Semester when the course unit is delivered	4
Course Coordinator	Suleimanova Sevda Shirin
Name of Lecturer(s)	Suleimanova Sevda Shirin
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
The goal of teaching the subject "Algorithmization and Programming" is to provide students with extensive knowledge of algorithms, to familiarize themselves with programming languages, and to teach students algorithmization and programming in more depth.

Course Objectives:
The subject "Algorithmization and Programming" plays a basic role in acquiring technical knowledge using modern information technologies. Students in all technical specialties are provided with the necessary knowledge and instilled skills. Ensuring the scientific and methodological preparation of future specialists, forming in them the relevant knowledge, skills and habits for implementing education, familiarizing them with the accumulated experience in teaching the subject of Algorithmization and Programming, and forming the ability to think logically.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about the goals and objectives of algorithmization and programming as a science, scientific research methods, and its relationship with other sciences	1, 2
2	Formation of ideas about the forms of organizing training in the basics of programming	1, 2
3	Developing a program in C++ software	1, 2
4	least squares method, development of correlation dependencies based on specific examples	1, 2
5	Formation of ideas about the goals and objectives of teaching undergraduate students the basics of algorithmization and programming	1, 2
6	Performing practical tasks used in the training of the Fundamentals of Algorithmization and Programming course for undergraduate students	1, 2
7	Monitoring and investigating the level of performance of practical tasks	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program		
		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	4
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	4
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents			
Week	Chapter	Topics	Exam
1		Lecture 1.Information systems. The size of information	
2		ASCII and Unicode coding systems. Coding of numerical, textual and graphic information Seminar 1	

3		Algorithms. Properties, types, and description methods of algorithms Seminar 2	
4		Lecture 2.Basic constructions of algorithms	
5		The difference between the description of the algorithm through a programming language and previous descriptions Seminar 3	
6		Lecture 3.Basic concepts and principles of programming	
7		Lecture 4.Stages of program development	
8		Mathematical software packages. General information about MATLAB, MATCAD, MATHEMATICA programs Seminar 4	
9		Modern programming languages. C++ program. Basic elements of the language Seminar 5	
10		Lecture 5.C++ program. Variables	
11		Lecture 6.C++ program. Conditional operators. Loops	
12		C++ program. Functions Seminar 6	
13		Lecture 7.C++ program. Arrays	
14		C++ program. Matrices Seminar 7	
15		C++ program. Graphics mode Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. Remizova O.I., Algorithmization and programming (C++), МИСиС, 2021
2. Khalilov M. Informatics. Baku, 2009.
3. Ibrahim-zade T., Sardarov Y. Fundamentals of computer networks and software. Baku, 2008.
4. “INFORMATICS” M.Alizadeh, M.Salmanova, X.Abbasva, M.Orujova, E.Seyidzadeh, textbook, Baku 2015
5. Gribanov V.P., Kalmykova O.V., Soroka R.I. Fundamentals of algorithmic programming and programming, M., Изд.центр ЕАОИ.-2008.
6. Semakin I.G., Shestakov A. P. Fundamentals of algorithmization and programming.-M. : Изд-во «Академия» 2008 г.
7. Wirt N. Algorithms and data structures. St. Petersburg, Nevsky Dialect, 2005

Assessment		
Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	
Assessment Criteria Final grades are determined according to the Academic Regulations of WCU		
Course Policies • Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations		
ECTS allocated based on Student Workload		
Total Workload		**120**
Total Workload/30(h)		**120/30**
ECTS Credits of the Course		**4**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Systems simulation
Course Unit Code	ATMF-BO4
Type of Course Unit	Elective
Level of Course Unit	2nd year

National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	2
Practice (hours/week)	
Laboratory (hours/week)	1
Year of Study	2
Semester when the course unit is delivered	4
Course Coordinator	Gasimov Ziraddin Amirahmed
Name of Lecturer(s)	Gasimov Ziraddin Amirahmed
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

The subject of "Systems Simulation" studies the processes of information processing and exchange and the methods and means of their implementation. These methods and means are applied in many fields of technical sciences, including information processing processes and network technologies. In modern times, it is a global complex in the field of obtaining geographically oriented, location-specific information in solving large-scale problems (social, economic, ecological, etc.), collecting it in special repositories, using it for specific purposes, and managing it through the application of space-based overview and special query programs.

Course Objectives:

The purpose of the subject “Systems Simulation” is to form the relevant knowledge and skills in information processing processes, information transmission through communication devices, network equipment, their use in solving various software application problems, using input and output devices of personal computers. (Brief information about the subject, related subjects (directly related/compatible), objectives of teaching the subject. It is noted what students will know, what they will achieve and what skills they will acquire by studying this subject

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about the purpose, subject and basic concepts of the subject	1, 2
2	Introduction to the subject of "systems simulation", its scientific value and modernity	1, 2

3	Systems simulation "to provide information about the relevance and practical nature of modern research"	1, 2
4	"Systems Simulation" and its development history, "Communication Channels" and its relationship with other scientific fields	1, 2
5	Systems simulation and its importance in modern times, A brief overview of the history of the creation of communication channels, A brief historical commentary on "Systems simulation"	1, 2
6	Systems simulation: its main purpose and important features, Modern approaches in the development of communication channels	1, 2
7	Basic components of "Systems Simulation" To master information about "Systems Simulation" software (software, hardware)	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4

10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Generalized circuit simulation of a communication system Seminar 1	
2		Lecture 1.Simulation of signal transmission over distance	
3		Modern types and simulation of electrical communication. Simulation of uninterrupted signal transmission systems Seminar 2	
4		Digital signals. basic concepts. structure and simulation of digital transmission. Signals used in digital transmission systems. their types. spectral description and parameters Seminar 3	
5		Signal transmission in digital transmission systems. Methods and simulation of signal processing and division in digital transmission systems. Seminar 4	
6		Lecture 2.Principles of construction and simulation of fiber optic transmission systems	
7		Lecture 3.Principles of discrete channel construction. Simulation of discrete channels with amplitude and frequency modulation	
8		Simulation of discrete channels with amplitude and frequency modulation. Discrete channels with phase and multiple modulation Seminar 5	
9		Lecture 4.Simulation of optical receivers, the main nodes of optical transmission systems	
10		Number systems. Signal coding rules. Signal transmission principles and simulation of switching equipment. Simulation of switching equipment. Simulation of optical amplifiers Seminar 6	
11		Lecture 5.Signal converter devices (modems)	
12		Lecture 7.Simulation of fiber optic transmission systems	

13		Lecture 8.Switching methods used in digital transmission networks	
14		Circuit and data-switched digital transmission networks Seminar 7	
15		Packet and hybrid switched digital transmission networks. Classification of electrical communication networks Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. Borodin L.F. Introduction to the theory of noise-resistance coding. M., "Soviet Radio", 2009
2. Brilin L. Science and theory information. M., Fizmatgiz, 2007
3. Klyuev N.I. Fundamentals of information transfer theory. M., "Soviet Radio", 2009
4. Meshkovsky K.A., Kirillov N.E. Coding in communication technology. M. "Communications", 2006

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**120**
Total Workload/30(h)	**120/30**
ECTS Credits of the Course	**4**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Ways to ensure cybersecurity
Course Unit Code	ATMF-BO5
Type of Course Unit	Elective
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	2
Semester when the course unit is delivered	4
Course Coordinator	Sema Bayramova Gadir
Name of Lecturer(s)	Sema Bayramova Gadir
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-
Course description: To form appropriate knowledge, skills and habits in students, and to ensure their preparation for working with computers.	

Course Objectives:
The purpose of the subject "Ways to Ensure Cybersecurity" is to consider cybersecurity issues and the principles of ensuring information security based on a systems approach, and to present the classification, characteristics, and methods of combating information threats. The management of the enterprise's cybersecurity is to ensure the protection of necessary information from unauthorized access, destruction, and modification in the acquisition, processing, use, and other processes. The main purpose of ensuring complex information security is to maintain the completeness and integrity of the facility's information system, minimize the alteration and destruction of information, and prevent information disclosure and leakage.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about the goals and objectives of the discipline of cybersecurity as a science, scientific research methods, and its relationship with other sciences;	1, 2
2	To form an understanding of the goals and objectives of the "Ways to Ensure Cybersecurity" training for undergraduate students;	1, 2
3	Performing practical tasks used in the training of the "Ways to Ensure Cybersecurity" course for undergraduate students;	1, 2
4	Monitoring and investigating the level of implementation of practical tasks;	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5

7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	4
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1.Theoretical issues of cybersecurity. Types of information concepts. Characteristics of information. Information system Conceptual model of information security And its security	
2		Seminar 1	
3		Lecture 2.Threats against information. Activities aimed at the illegal seizure of confidential information. Methods of information protection	
4		Seminar 2	
5		Lecture 3.A systematic approach to ensuring the security of cyberspace A comprehensive approach to solving the problem of information security. Information security concept. Information security strategy	
6		Seminar 3	
7		Lecture 4.Principles of connecting network firewalls. Intrusion detection systems	
8		Seminar 4	
9		Lecture 5.ISO/IEC27000: Information technology, security technology. Cobit 2019 methodology. NIST SP 800-532 Rev	
10		Seminar 5	
11		Lecture 6.Cryptographic methods of information protection. Cryptographic systems and requirements for them. Model of a cryptographic system. Classification of cryptographic systems	
12		Seminar 6	

13		Lecture 7.Cybersecurity incidents. Incident concept and types of incidents. Cyberespionage incidents. Malware. Network scanning. DoS attacks	
14		Seminar 7	
15		Inappropriate use incidents. Unauthorized access incidents. Intellectual property incidents. Social engineering incidents Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. https://wcu.edu.az/uploads/files/Cyber%20Crime%20Investigations%20(%20PDFDrive%20).pdf
2. https://www.academia.edu/16734335/Kiber_t%C9%99hl%C3%BCk%C9%99sizlik
3. https://www.csd.org.ge/storage/files/doc/kibertehlukesizlik-etraf-muhit-analizi-ve-onleyici-mexanizmler.pdf
4. Gasimov V.A. Modern technologies of information protection. Textbook. Baku. Publishing house of the Heydar Aliyev Academy of the Ministry of National Security. 2011, 112
5. Aliguliyev RM, Imamverdiyev YN Information security incidents. Baku "Information Technologies" publishing house, 2012, 219 p.
6. Gasimov V.A. Information security: computer crime and cyberterrorism. Baku: Elm. 2007, -192 p.
7. NIST PS 850-53 Rev2,5. COBIT 2019 Toolkit Excel

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**120**
Total Workload/30(h)	**120/30**
ECTS Credits of the Course	**4**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Communication Channels
Course Unit Code	ATMF-BO5
Type of Course Unit	Elective
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	2
Semester when the course unit is delivered	4
Course Coordinator	Sema Bayramova Gadir
Name of Lecturer(s)	Sema Bayramova Gadir
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-
Course Description: To form appropriate knowledge, skills and habits in students, and to ensure their preparation for working with computers.	

Course Objectives:
The purpose of the subject "Communication Channels" is to form the relevant knowledge and skills in the basics of digital switching, the software used, information processing processes, information transmission through communication devices, network equipment, their use in solving various software application problems, and using the input and output devices of personal computers.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Ability to interpret acquired knowledge about information processes and their implementation;	1, 2
2	Ability to use information technologies;	1, 2
3	Ability to use computer network equipment;	1, 2
4	Study and eliminate errors that occur in channels during network construction.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	4
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	3
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the	3

	impact of engineering decisions in various fields	
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1.Fundamentals of digital transmission system (DTS). Fundamentals of digital switching. Switching area of DTS (DS) DTS control devices. Software in digital switching	
2		Seminar 1	
3		Lecture 2.Application of the latest technologies for communication channels. National telecommunications networks. Design of telecommunications networks	
4		Seminar 2	
5		Lecture 3.Introduction to computer networks. Development stages of computer networks. Brief history of the Internet. Structure of the Arpanet network. Structure of the Internet	
6		Seminar 3	
7		Lecture 4.Local computer networks. Types of local networks. Single-layer and hierarchical networks. Topologies of local computer networks. Shintology. Ring topology. Local networks with star topology	
8		Seminar 4	
9		Lecture 5.Physical media (communication channels) through which information is transmitted in local networks. Coaxial cables. Thin coaxial cable. Thick coaxial cable. Twisted pair cables. UTP (unshielded) and STP (shielded) cables. Repeaters. Bridges. Network adapter cards. Concentrator. Switch	
10		Seminar 5	
11		Lecture 6.OSI reference model. Communication tools in the OSI model. Comparison and protocols of the OSI model and the TCP model. Levels of the OSI model	
12		Seminar 6	
13		Lecture 7.Modem communication. Modem standards. Principles of organizing modem communication. High-speed local area network technologies: Fast Ethernet, Gigabit Ethernet	
14		Seminar 7	

15		Addressing in TCP/IP communication networks. Fixed and variable mask subnets. Routing in TCP/IP communication networks. Routing tables. Routing protocols Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. Flatley, Marie E., Communication channels, http://www.answers.com/topic/communicationchannels, 2021
2. Bayramov HM, Mansimov H.I., Mammadov A.S. Fundamentals of computer networks. Textbook. Baku: “University of Economics” Publishing House – 2019. -142 p.
3. B. Olifer, N. Oliver. Computer networks, technological principles, protocols. Textbook. Moscow, 2016.
4. CISCO: ``Cisco Visual Networking Index: Forecast and Methodology, 2009–2014,'' Cisco Systems Inc., June 2010.
5. M.I.MAMMEDOV, M.U.ORUCOVA, NMBAYRAMOVA – Computer networks. (Textbook). ADAU publishing house, 2014. -136 p.
6. M.I. Myammyadov, M.Ts. Oruzhova, N.M. Bairamova. Computer networks. Baku, 2014.
7. R. Shihyaliyev. Shyabyak technologies. Baku, 2018.
8. Shikhaliyev RH "Network technologies. Course of lectures" Textbook. Baku: "Information Technologies" publishing house, 2017, 143 p.
9. E. Tanenbaum, D. Uzzeroll. Computer networks. 5th edition - 2016.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**120**
Total Workload/30(h)	**120/30**
ECTS Credits of the Course	**4**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Information Communication Systems
Course Unit Code	ATMF-BO6
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	2
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	5
Course Coordinator	Sema Bayramova Gadir
Name of Lecturer(s)	Sema Bayramova Gadir
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
"Information communication systems"The purpose of the subject "" - In connection with the development of Internet technologies of telecommunications, information resources are rapidly increasing, new information relations and forms of employment are emerging. In the current conditions, scientific knowledge and information resources are considered the main scientific, economic and spiritual wealth of society. The Internet has wide opportunities in the formation of public opinion, in making decisions in the political, economic and military spheres, in influencing the information resources of the enemy, and also in the dissemination of specially prepared false information. The active use of the Internet network for waging information warfare is explained by its superiority over traditional methods (mass media) and technologies.

Course Objectives:
To form appropriate knowledge, skills and habits in students, and to ensure their computer skills

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Information and communication systemsFormation of ideas about the goals and objectives of the discipline as a science, scientific research methods, and its relationship with other sciences	1, 2
2	For students studying at the bachelor's level, "Information and communication systems"Formation of ideas about the goals and objectives of the training"	1, 2
3	For students studying at the bachelor's level, "Information and communication systems"Performance of practical tasks used in the training of the course	1, 2
4	Monitoring and investigating the level of performance of practical tasks	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall	5

	performance and reliability of systems	
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	4
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		A systematic approach to communication processes. Elementary structure of a communication system Seminar 1	
2		Lecture 1.Communication means – communication lines	
3		Communication networks Seminar 2	
4		Lecture 2.Communication devices	
5		Lecture 3.Switching methods and technologies in global networks	
6		Technologies on the network Seminar 3	
7		Lecture 4.OSI model	
8		OSI model levels Seminar 4	
9		Lecture 5.Stages of creating information systems. Stages of the IS life cycle. Life cycle models of information systems	

10		VBIS. Problem Solving Seminar 5	
11		Lecture 6.Biometrics	
12		Geographic information systems Seminar 6	
13		Lecture 7.Internet	
14		Managing addresses on the Internet Seminar 7	
15		Solving Excel problems Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. KOODLI, R., and PERKINS, C.E.: Mobile Inter-networking with IPv6, New York: John Wiley & Sons, 2022.
2. KOOPMAN, P.: ''32-Bit Cyclic Redundancy Codes for Internet Applications,'' Proc. Intl. Conf. on Dependable Systems and Networks., IEEE, pp. 459–472, 2020.
3. Karimov S.Q., Habibullayev S.B., Ibrahimzade T.I.. Informatics. Textbook for higher education institutions. Baku, 2019.
4. Hajiyeva RC Informatics Baku, Publishing and Printing Center of the State University of Economics, 2022.
5. Aliyev A.Й. Informatics and programming. Baku, Mtsyarim, 2018.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies • Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations	
ECTS allocated based on Student Workload	
Total Workload	**120**
Total Workload/30(h)	**120/30**
ECTS Credits of the Course	**4**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Human Computer Interface (UI/UX)
Course Unit Code	ATMF-BO6
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	2
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	5
Course Coordinator	Hamidova Raksana Eyvaz
Name of Lecturer(s)	Hamidova Raksana Eyvaz

Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
The aim of this course is to teach students the basic principles, tools and methods of human-computer interface (HCI), user experience (UX) and user interface (UI) design. Through the course, students will learn to develop interactive and user-friendly interfaces by effectively using the psychology of design, the principle of user-centered design, and design tools such as Figma, and then implement these designs in code.

Course Objectives:
This course covers the areas of human-computer interface and UX/UI design. Within the scope of the course, students are provided with detailed information about the basics of user experience and interface design, modern design tools (especially Figma), and practical applications of design. The course also covers the basic principles of visual design, creating interactive prototypes, and implementing designs with code. Through practical lessons, students will be taught how to connect coding with design and how to apply various design elements

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	They will understand the basic concepts and principles in the fields of human-computer interface, UX, and UI design	1, 2
2	They will be able to effectively use design tools like Figma.	1, 2
3	They will create prototypes and interfaces applying user-centered design principles	1, 2
4	They will create user-friendly designs by applying basic visual design principles.	1, 2
5	They will convert designs into websites using HTML, CSS, and JavaScript	1, 2
6	They will refine their designs by subjecting their prototypes to user testing.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4

3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	4
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	5
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		What is Human-Computer Interface? Differences between UX (User Experience) and UI (User Interface). History of HCI and UX/UI design Seminar 1	
2		Key concepts: Ergonomics, interactivity, response time. First UX/UI. Principles and Philosophy	
3		Basic UX principles: user requirements, simplicity, reliability, sustainability. Visual hierarchy and connectivity in UI design Seminar 2	
4		Psychology of Design: User Behaviors and Reactions. First UI Design: Key Terms and Components	
5		Design schemes. Color palettes. Grid system and guidelines Seminar 3	

6		Introducing Figma. Installing Figma	
7		Basic Design Operations with Figma. Creating Images, Buttons, and Text Areas Seminar 4	
8		Using Figma tools: Rectangle, Circle, Line, Text	
9		Prototypes. Creating Designs Seminar 5	
10		Creating Interactive Designs	
11		Adding transitions, animations, and interactivity Seminar 6	
12		Lecture 6.Figma's Linking feature	
13		Basic UX/UI Design Principles and Practice	
14		Coding from Figma: Advancing Design with Code Seminar 7	
15		Responsive Web Design (RWD) and Mobile Compatibility Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. **"Don't Make Me Think: A Common Sense Approach to Web Usability"**-Steve Krug
2. This book explains the basic concepts of user experience and interface design in a simple and practical way.
3. **"The Design of Everyday Things"**-Don Norman
4. A fundamental resource on HCI and the psychology of design. It provides an in-depth explanation of user-centered design principles.
5. **"Lean UX: Applying Lean Principles to Improve User Experience"**- Jeff Gothelf
6. It teaches the application of Lean UX methodology and how to rapidly improve user experience.
7. **"Universal Principles of Design"**- William Lidwell, Christina Holden, Jill Butler
8. It is a resource that covers the basic principles and best practices of design.
9. **“Figma for UX/UI Design”**- Figma Design Team
10. Provides detailed information about the usage instructions and design tools of Figma.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	

Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**120**
Total Workload/30(h)	**120/30**
ECTS Credits of the Course	**4**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Mobile Programming
Course Unit Code	ATMF-BO7
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	

Year of Study	3
Semester when the course unit is delivered	5
Course Coordinator	Hamidova Raksana Eyvaz
Name of Lecturer(s)	Hamidova Raksana Eyvaz
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

This course aims to provide students with the theoretical and practical knowledge necessary to develop both mobile and desktop applications by teaching them the basics of the C# programming language, the capabilities of the .NET platform, and the principles of object-oriented programming (OOP). The course also covers the effective use of development environments such as Visual Studio or VS Code, basic programming concepts, creating methods and classes, handling exceptions, working with files, and building real programs through small projects.

Course Objectives:

Starting with the "Introduction and Basic Concepts" section, the course teaches students the basic syntax of the C# language, variables and data types, operators, control structures (conditional and loop operators), arrays and collections, methods, classes and objects, constructors and destructors, inheritance and polymorphism, exception handling, file handling, and object-oriented programming concepts. At the end of the course, students will apply the theoretical knowledge they have learned to develop a small project - for example, a product management program, a simple calculator, or a game

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	They will be able to clearly understand and explain the syntax and basic programming concepts of the C# language	1, 2
2	They will gain skills in writing code, debugging, and building projects in development environments such as Visual Studio or VS Code.	1, 2
3	They will be able to develop programs using variables, operators, control structures, arrays, methods, and classes.	1, 2
4	They will develop object-oriented programs by applying OOP principles and use concepts such as inheritance and polymorphism in real projects.	1, 2
5	They will gain practical application knowledge through exception management, file handling, and developing small projects.	1, 2
6	They will gain development skills in C# for mobile applications or desktop applications and use the capabilities of the .NET platform.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation		
Course's Contribution to the Program		
		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	4
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1. Mobile app concept. Variables and Data Types. Operators. Declaring and using variables	
2		Seminar 1	

3		Lecture 2. Control Structures Conditional operators: if, else if, else switch-case structure usage. Loop operators: for, while, do-while	
4		Seminar 2	
5		Lecture 3. Arrays and Collections Arrays and their types Collection types such as List and Dictionary Basic operations with Array and List (add, remove, get)	
6		Seminar 3	
7		Lecture 4. Methods and Functions Creating and calling methods Parameters and return values Scope of methods, overloading Classes and Objects What is a class and creating objects Properties and methods Encapsulation (privacy levels: public, private)	
8		Seminar 4	
9		Lecture 5. Constructor and Destructor What is a constructor and how is it used? Default and parameterized constructor Destructor (Mainly at the introductory level)	
10		Seminar 5	
11		Lecture 6. Inheritance and Polymorphism Inheritance: base and derived classes Method overriding and virtual, override keywords Polymorphism and its application	
12		Seminar 6	
13		Lecture 7. Exception Handling try, catch, finally blocks Different exception types and their handling Throwing an exception (throw keyword)	
14		Seminar 7	
15		Working with Files File reading and writing operations StreamReader, Stream Writer and File classes Data storage with simple file operations Object Oriented Programming (OOP) Concepts Abstraction and Encapsulation Inheritance and Polymorphism Applying OOP principles with a small project Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. Magee, MR (2017). Swift programming: The Big Nerd Ranch guide (1st ed.). Big Nerd Ranch.
2. Mehrtens, M. (2017). iOS programming: The Big Nerd Ranch guide (6th ed.). Big Nerd Ranch.
3. Amelia. (2017). Android programming: The Big Nerd Ranch guide (3rd ed.). Big Nerd Ranch.
4. Lance. (2017). Mastering Xamarin UI development (1st ed.). Pact Publishing.
5. Heggelund, P. (2017). Xamarin mobile application development: Cross-platform C# and Xamarin.Forms fundamentals (1st ed.). Pact Publishing.
6. Kirupa, C. (2017). Learning React (1st ed.). O'Reilly Media.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Mechanics and Mathematics"

Course Unit Title	Materials Science
Course Unit Code	ATMF-BO7
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	

Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	5
Course Coordinator	Rustamova Durdana Farhad
Name of Lecturer(s)	Rustamova Durdana Farhad
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	

Course description:

The subject "Materials Science" provides basic information about the composition, structure, chemical, physical and mechanical properties of materials, the determination of the physical and mechanical properties of materials through testing methods, and materials used in industry and their promising types and properties.

Course Objectives:

"Materials Science"The goal and main objective of teaching materials science is to form knowledge about materials science in students, to study the principles of creating new types of materials, the structure of materials, their physical and chemical properties, and the properties of alloys with different compositions.

Learning Outcomes

At the end of the course the student will be able to know		Assessment
1	Materials scienceclassification	1, 2
2	The role of materials science in the development of technical systems	1, 2
3	Hardness measurement methods	1, 2
4	Non-ferrous metals and their alloys	1, 2
5	Solid alloys and mineral - ceramic materials	1, 2
6	Non-metallic materials	1, 2

7	Connecting materials	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		
Course's Contribution to the Program		
		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	4
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	4
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	3
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		
Course Contents		

Week	Chapter	Topics	Exam

1		Lecture 1.The purpose and historical development of the discipline.Basic information about metals, their classification and properties.Ferrous and non-ferrous metals. Crystalline structure of metals. Crystal lattice of metals. Crystallization process of metals	
2		Seminar 1	
3		Lecture 2.Basic information about alloys. Internal structure of alloys. Crystallization of alloys. Crystallization process of liquid alloys	
4		Seminar 2	
5		Lecture 3.General information on the production of cast iron and steel. Characteristics of the phase diagram of iron-carbon alloys. Structures of iron-carbon alloys. General information about steel production. Bessemer and Thomas processes in steel production. Steel production by the Marten process	
6		Seminar 3	
7		Lecture 4.General information about heat treatment. Transformations occurring in steel during heating. Heating devices. Heat treatment units. The essence of the chemical-thermal treatment process. Heat treatment of gray cast iron. Production of wrought iron	
8		Seminar 4	
9		Lecture 5.Non-ferrous metals and their alloys. Copper alloys. Tin, bronze. Special bronzes. Aluminum	
10		Seminar 5	
11		Lecture 6.Cast Al alloys.Deformable alloys. Magnesium and its alloys. Titanium and its alloys.Non-metallic materials	
12		Seminar 6	
13		Lecture 7.Basic parameters of electrical materials. Classification of dielectric materials. Gaseous dielectrics. Liquid dielectrics.Electrical insulating varnishes. Compounds. Fibrous electrical insulating materials. Electrical insulating plastic masses	
14		Seminar 7	
15		Semiconductor materials. Basic semiconductor materials. Magnetic materials. Soft magnetic materials. Hard magnetic materials. Ferrites Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. F.D. Gelin, E.I. Krupitsky, I.P. Poznyak. Materials science. "Maarif" publishing house. Baku, 1983.
2. Y.G. Vonogradov, S.S. Orlov, L.A. Popova. "Materials science for plumbers, locksmiths, and mechanics of construction machines. Maarif, 1983.
3. V.A. Dubrovksi "Basics of material science". Azertadrisneshr, Baku 1963.

4. "Spravochnik po elektrotekhnicheskim materialom". B. 3т.т. 2/нод ed. Yu.V. Korichkoho and others. M. Energoatomizdat 1987.		
Assessment		
Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	
Assessment Criteria Final grades are determined according to the Academic Regulations of WCU		
Course Policies • Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations		

ECTS allocated based on Student Workload	
Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Mechanics and Mathematics"

Course Unit Title	Engineering Mathematics
Course Unit Code	ATMF-BO8
Type of Course Unit	Elective

Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	5
Course Coordinator	Bashirov Shaban Hashim
Name of Lecturer(s)	Bashirov Shaban Hashim
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

"Engineering Mathematics". Mathematics is a discipline that deals with the application of mathematical methods to solve real-world problems, including science, technology, economics, physics, biology, and other fields. It is key to the development of technological and economic progress, as it allows solving complex problems in various areas, such as optimizing production, reducing costs, improving product quality, etc.

Course Objectives:

"Engineering Mathematics". It is of great importance for the development of science and technology in our lives, helping to create new innovative products, improve living conditions, and solve the complex problems that modernity poses to us.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	To know mathematical methods and their application possibilities, it is enough to be knowledgeable in all areas of mathematics.	1, 2
2	to have the logic and methodology of applied mathematics, modeling methodology	1, 2
3	to have the art of putting up and formalizing actual jokes	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program		
		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	4
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	4
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	4
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	3
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents			
Week	Chapter	Topics	Exam
1		Lecture 1.Definition of vector, classification of vectors. Linear operations on vectors. Projection of a vector onto an axis. Vector coordinates	
2		Seminar 1	
3		Lecture 2.Scalar product of vectors. Cross product of vectors. Derivative of three vectors	

4		Seminar 2	
5		Lecture 3.The concept of matrix.Types of matrices. Linear operations on matrices. Nonlinear operations on matrices	
6		Seminar 3	
7		Lecture 4.Determining the determinant of a matrix. Determining the rank of a matrix. Transformation (rotation) of the coordinate system. Systems of linear equations	
8		Seminar 4	
9		Lecture 5.Eigenvalues of a matrix. Eigenvectors of a matrix.Differential calculus. The concept of derivative	
10		Seminar 5	
11		Lecture 6.Physical and geometric meaning of the derivative. Rules of differentiation	
12		Seminar 6	
13		Lecture 7.Integral calculus.Indefinite integral. Definite integral	
14		Seminar 7	
15		Lecture 8.Areas of application of differential and integral calculus	

Recommended Sources

TEXTBOOK(S)

1. N.B. BURMASHEVA, E.Yu. PROSVIRYAKOV, S.A. BERESTOVA, ENGINEERING MATHEMATICS, Textbook, Yekaterinburg, 2022
2. D.V. Vershinin Program of the entrance examination for the profile subject "BASIC ENGINEERING MATHEMATICS" Moscow 2021
3. N.I. Korshunova APPLIED MATHEMATICS FOR ECONOMISTS Study guide for bachelor's degree, MOSCOW, 2021

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria Final grades are determined according to the Academic Regulations of WCU	
Course Policies • Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations	
ECTS allocated based on Student Workload	
Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Systems Analysis
Course Unit Code	ATMF-BO8
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	1
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	5
Course Coordinator	Ahmadova Esmira Nariman

Name of Lecturer(s)	Ahmadova Esmira Nariman
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

""Systems analysis" is a scientific and methodological discipline that studies the methods, tools, and principles of describing complex objects as systems and analyzing these systems. Systems analysis is a set of concepts, methods, and technologies for studying, describing, and creating various systems (processes and phenomena).

Course Objectives:

The purpose of the subject "Systems Analysis" is to study the role, characteristics, principles, stages, and methods of system modeling of systemic analysis and a systematic approach in solving management problems.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about the purpose, subject and basic concepts of the subject;	1, 2
2	formation of ideas about systems analysis;	1, 2
3	formation of ideas about the systematic approach, its essence and principles;	1, 2
4	Formation of ideas about the features of a systematic approach in solving management problems	1, 2
5	forming ideas about modeling;	1, 2
6	formation of ideas about building a system model;	1, 2
7	Formation of ideas about computer modeling, stages, and instrumental tools;	1, 2
8	requirements analysis and formation of ideas about the initial design of the system;	1, 2
9	Formation of ideas about the application of situation modeling in decision-making;	1, 2
10	formation of the ability to describe simple objects as systems;	1, 2
11	formation of the ability to classify objects according to various characteristics;	1, 2
12	Formation of the ability to conduct system analysis of simple systems.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1.The purpose, subject and basic concepts of the discipline. System analysis. Systematic approach, essence and principles	
2		Seminar 1	
3		Lecture 2.A systematic approach to studying and improving complex systems. Stages of systematic analysis in solving management problems	

4		Seminar 2	
5		Lecture 3.Modeling. Types of modeling	
6		Seminar 3	
7		Lecture 4.Information modeling. Classification of information models	
8		Seminar 4	
9		Lecture 5.The main stage of systematic analysis is building a model of the object under study.	
10		Seminar 5	
11		Lecture 6.Computer modeling, stages, instrumental tools	
12		Seminar 6	
13		Lecture 7.Mathematical modeling.Modeling problems. Modeling a system under conditions of certainty	
14		Seminar 7	
15		Lecture 8.Requirements analysis and preliminary system design	

Recommended Sources

TEXTBOOK(S)

1. Karimov SQ Information systems. -Baku: Elm, 2008, 676p.
2. Sardarov YB Mathematical elements of informatics and computing /Textbook/. – Baku, 2006. – 102 p.
3. Bakhvalov L. Types of modeling. Computer modeling. http://bourabai.kz/cm/bahvalov2.htm
4. Gubanov V.A., Zakharov V.V., Kovalenko A.N. Introduction to system analysis. L.: Изд-во Ленинградского ун-та, 1988. 232 с.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies	
• Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations	
ECTS allocated based on Student Workload	
Total Workload	**90**
Total Workload/30(h)	**90/30**
ECTS Credits of the Course	**3**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Web Programming
Course Unit Code	ATMF-BO9
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	2
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	6
Course Coordinator	Sevda Suleimanova
Name of Lecturer(s)	Sevda Suleimanova

Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

The web programming course covers the steps taken on the front-user and back-server sides and familiarization with relevant technologies for developing web applications (writing programs for the operation of dynamic sites on the World Wide Web), and is intended to teach students important concepts and increase their basic knowledge. It includes sections on the description, explanation of modern concepts used in the web and web programming, and their application and use in modern times.

Course Objectives:

The web programming course covers modern web standards for developing interactive websites, technologies used to achieve the set goal on the server and user side. Students are provided with the formation of relevant knowledge, skills and habits, and they master the capabilities of technical tools and software needed to develop dynamic websites.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	The main purpose and capabilities of the web, internet, and web programming;	1, 2
2	Formation of ideas about web programming training tools	1, 2
3	Formation of ideas about the principles and training methods of web programming training;	1, 2
4	To form an understanding of the goals and objectives of Web programming training for undergraduate students;	1, 2
5	Performing practical tasks used in the training of Web programming course for undergraduate students; Monitoring and investigating the level of implementation of practical tasks;	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4

3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	4
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. Web technologies, programming languages. Browser	
2		Lesson 2. HTML standards. HTML structure, element families. Static web pages Seminar 1	
3		Lesson 3. Block, line type tags. Table	
4		Lesson 4. Headings, hyperlinks, text formatting elements Seminar 2	
5		Lesson 5. Forms and their elements. Transferring data using forms	
6		Lesson 6. CSS. Selectors Seminar 3	
7		Lesson 7. CSS rules. Inline, block, inline-block elements	
8		Lesson 8. Units of measurement, colors in CSS Seminar 4	

9		Lesson 9. The concept of edge, distance from the edge, and frame	
10		Lesson 10. Elements positioning properties in CSS, z-index Seminar 5	
11		Lesson 11. Pseudo classes	
12		Lesson 12. HTML coding styles. Fixed, “rubber”, adaptive coding Seminar 6	
13		Lesson 13. Javascript. Login and connection rules	
14		Lesson 14. Javascript. Variables, operators and period operators Seminar 7	
15		Lesson 15. Javascript. Conditional operator and functions	

Recommended Sources

TEXTBOOK(S)

1. Ben Henick. HTML and CSS. Path to perfection. 2011. Peter.
2. John Duckett. HTML & CSS Design and Build websites. John Wiley & Sons, Inc.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**120**
Total Workload/30(h)	**120/30**

ECTS Credits of the Course	**4**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Computer Systems design
Course Unit Code	ATMF-BO9
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	2
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	6
Course Coordinator	Gurban Muradov Etibar
Name of Lecturer(s)	Gurban Muradov Etibar
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

- To form appropriate knowledge, skills and habits in students, and to ensure their computer skills
- Computer systems designFormation of ideas about the goals and objectives of the discipline as a science, scientific research methods, and its relationship with other sciences;
- For students studying at the bachelor's level, "IT project management"Formation of ideas about the goals and objectives of training;
- For students studying at the bachelor's level, "IT project management"Performance of practical tasks used in the training of the course;
- Monitoring and investigating the level of performance of practical tasks.

Course Objectives:

In connection with the development of Internet technologies of telecommunications, information resources are rapidly increasing, new information relations and forms of employment are emerging. In the current conditions, scientific knowledge and information resources are considered the main scientific, economic and spiritual wealth of society. The Internet has wide opportunities in the formation of public opinion, in making decisions in the political, economic and military spheres, in influencing the information resources of the enemy, and also in the dissemination of specially prepared false information. The active use of the Internet network for waging information warfare is explained by its superiority over traditional methods (mass media) and technologies.

Learning Outcomes

At the end of the course the student will be able to know		Assessment
1	Communication processes	1, 2
2	Information transmission systems	1, 2
3	Internet services	1, 2
4	VPNs, their creation	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5

6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	4
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. Preparing and planning projects Seminar 1	
2		Lesson 2. Development stages of software and applications	
3		Lesson 3. Preparing and managing IT infrastructure Seminar 2	
4		Lesson 4. Testing and verification methods	
5		Lesson 5. Ensuring project safety Seminar 3	
6		Lesson 6. Developing user-centered projects Seminar 4	
7		Lesson 7. Ensuring speed and performance	
8		Lesson 8. Updating projects and adding new functionality Seminar 5	
9		Lesson 9. Management, monitoring and technical support	
10		Lesson 10. Data analytics and database management Seminar 6	
11		Lesson 11. Introduction to new technologies: Cloud technology	
12		Lesson 12. IT project evaluation and financial management	
13		Lesson 13. Basic project management methods Seminar 7	
14		Lesson 14. Managing open source projects	

15		Lesson 15. Provisioning and integrating large-scale infrastructure Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. KOODLI, R., and PERKINS, C.E.: Mobile Inter-networking with IPv6, New York: John Wiley & Sons, 2022.
2. KOOPMAN, P.: ''32-Bit Cyclic Redundancy Codes for Internet Applications,'' Proc. Intl. Conf. on Dependable Systems and Networks., IEEE, pp. 459–472, 2020.
3. Karimov S.Q., Habibullayev S.B., Ibrahimzade T.I.. Informatics. Textbook for higher education institutions. Baku, 2019.
4. Hajiyeva R.C. Informatics Baku, Publishing and Printing Center of the State University of Economics, 2022.
5. Aliyev A.Й. Informatics and programming. Baku, Mtsyarim, 2018.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**120**
Total Workload/30(h)	**120/30**
ECTS Credits of the Course	**4**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Development of Desktop Application
Course Unit Code	ATMF-B10
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hours/week)	2
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	6
Course Coordinator	Sema Bayramova Gadir
Name of Lecturer(s)	Sema Bayramova Gadir
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
To form appropriate knowledge, skills and habits in students, and to ensure their preparation for working with computers.
Developing Desktop Applications is a subject aimed at providing students with the theoretical and practical knowledge required to create software applications that work in desktop environments. This subject teaches the creation of user-friendly, reliable and functional applications through various programming languages and technologies. The aim of the subject is to provide students with the programming knowledge necessary to develop desktop applications and to train them professionally in all stages, from building the application architecture, to designing the user interface, integrating with

the database and publishing the application.

Course Objectives:

The purpose of the subject "Development of Desktop Applications" is to provide students with a broad range of skills in creating, developing, testing, optimizing, securing, and deploying desktop applications. This course will provide students with in-depth knowledge of programming languages, databases, and UI design, while also providing hands-on experience on real-world application projects. The course is designed to provide detailed information on the topics covered and to enable them to develop in-depth skills in this area during their studies.The subject will also support their professional development and provide them with important skills in the future, such as application development, project management, and teamwork.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Learn about the basic concepts of desktop applications	1, 2
2	Understanding of basic programming languages and tools	1, 2
3	Knowledge of User Interface (UI) and User Experience (UX) principles	1, 2
4	Ability to provide UI design and user interactivity	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5

7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	4
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. Introduction to desktop applications and application types. Areas of use (business, personal use, industrial applications, etc.) Seminar 1	
2		Lesson 2. Architecture and Technologies of Desktop Applications Desktop, Web, Mobile, Windows Forms, WPF, UWP, MAUI	
3		Lesson 3. Application User Interface (UI) Design.User Interface (UI) and User Experience (UX). Difference between UI and UX concepts. UI design tools (Figma, Adobe XD, Sketch) Seminar 2	
4		Lesson 4. Programming and Coding Basics. C# language basics, Variables, methods, OOP concepts (class, inheritance, polymorphism). Functions, variables, classes and objects	
5		Lesson 5. Introduction to the .NET Platform. CLR, .NET Framework vs .NET Core vs .NET 6/7/8 Seminar 3	
6		Lesson 6. User Interface Design with XAML, HTML, and CSS. Basic concepts of XAML for WPF and WinForms users. UI design with HTML and CSS (for Electron) UI components and layouts (Button, TextBox, ComboBox, etc.)	
7		Lesson 7. Event Handling and Data Management in Applications. Introduction to the event-driven programming model Seminar 4	
8		Lesson 8. Data Management and Databases	

9		Lesson 9. Database basics. Database concepts, SQL and NoSQL. Connecting to a database (SQL Server, SQLite or MySQL). Working with Entity Framework (C#) and SQLite. Writing SQL queries (INSERT, SELECT, UPDATE, DELETE) Seminar 5	
10		Lesson 10. Asynchronous Programming and Multithreading	
11		Lesson 11. Security, Testing, and Debugging. Tapplication security and user data protection. Password storage and encryption methods Seminar 6	
12		Lesson 12. Packaging and Distributing Desktop Applications. Creating user-ready .exe, .dmg, .appimage files. Creating an installer (Inno Setup, Wix Toolset)	
13		Lesson 13. Cross-platform Application Creation. Cross-platform applications with Electron or MAUI Seminar 7	
14		Lesson 14. Running an application from the same code base for Windows, macOS, and Linux. Cross-platform version control and optimization	
15		Lesson 15. Mobile Programming, Android, iOS, Cross-platform programming Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. https://shaftali.az/blog/programlarin-hazirlanmasi-desktop-ve-mobil-programlasdirma
2. https://flegri.com/komputer-programlari
3. https://lumusoft.com/ru/service/mobile-and-desktop-applications
4. P. Orujaliyev “Mathematical elements of information systems”. Baku, 2015, 328.p.
5. A. Alekperov, M. Valiyev, S. Purhani “Management”. Baku, 2013, 600 p.
6. A.M. Abbasov, V.A. Gasimov, R.H. Guliyev “Decision-making methods in intellectual information systems”. Baku, 2003, 254 p.
7. SQ Karimov “Management information technologies and corporate information systems”. Baku, 2010, 426 p.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	

Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload	
Total Workload	**150**
Total Workload/30(h)	**150/30**
ECTS Credits of the Course	**5**

Computer Engineering bachelor program, Department of "Mechanics and Mathematics"

Course Unit Title	Laser and Its Use
Course Unit Code	ATMF-B10
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hours/week)	2
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	3
Semester when the course unit is delivered	6
Course Coordinator	Elnara Firdus

Name of Lecturer(s)	Elnara Firdus
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
The subject "Laser and its application" is dedicated to the study of lasers, laser radiation, its properties and creation, types, operating principles and areas of laser application, holography and holographic discs, database creation and transfer to holographic discs.

Course Objectives:
The main goal of teaching the subject "Laser and its application" is to instill in future device engineers the ability to convey to students in detail the laser, laser radiation, their properties and creation, types, operating principle and areas of application, and to effectively use the knowledge they acquire during the course.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	The goal of teaching the subject is to achieve the main goal set during the course, to fulfill the intended tasks at a high level, to train educated and skilled professionals, and to educate a patriotic young generation.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	4
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	4
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4

6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	3
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		**Lecture 1.** Introduction, brief history of the creation of the laser. Radiation. Spontaneous and stimulated emission. Absorption. Absorption coefficient Seminar 1	
2		**Lecture 2.** Laser physics. Laser device. Optical quantum generator. Properties of laser radiation. Monochromaticity. Coherence. Focusing. Temperature	
3		**Lecture 3.** Optical resonators, types, structure. Active and passive resonator. Laser resonators according to the radii of curvature of mirrors Seminar 2	
4		**Lecture 4.** Types of laser.Solid-state lasers. Gas discharge, gas dynamic and chemical gas lasers	
5		**Lecture 5.** Molecular lasers.Semiconductor lasers, structure Seminar 3	
6		**Lecture 6.** Working principle of a laser. Active medium and exciter. Quantum amplifier	
7		**Lecture 7.** Laser communications. Military lasers. Lasers in the entertainment industry. Lasers in transportation. Laser gadgets Seminar 4	
8		**Lecture 8.** Holography, history of creation. Physical principles. Leyte's transfer scheme. Denisuk-Patnieksinrelocation scheme	

9		**Lecture 9.** Holographic photomaterials. Practical areas of use Seminar 5	
10		**Lecture 10.** Holographic database. Storing the database in memory	
11		**Lecture 11.** Holographic discs. Writing and reading information on discs	
12		**Lecture 12.** Mathematical model.Tensors.Elements of tensor calculus Seminar 6	
13		**Lecture No. 13.** Building a mathematical model of disks Seminar 7	
14		**Lecture No. 14.** Development of a mathematical model of writing and reading information on disks	
15		**Lecture No. 15.** Laser radiation. Danger to the body. Negative effects of laser rays on the human body. Protection from laser rays Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. RC Gasimova, R.A. Karamaliyev, Fundamentals of Quantum Electronics, Baku University Publishing House 1991
2. N.V. Turchina, L.I. Rudakova, O.I. Surov, G.G. Spirin, T.A. Yushchenko, "Physics", Moscow, Издательский Дом Дрофа-2000, 671 c.
3. I.V. Saveliev, «Course of General Physics. Waves and Optics». Книга 4. Минск-2001, 256 c.
4. Korolenko P.V.Methods of computer optics. Laboratory of coherent optics of the physical faculty of Moscow State University (1997). Access date: August 18, 2019.
5.Leit E., Upatnieks Yu. ФОТОГРАФИРОВАНИЕ С ПОМОЩЮЮ ЛАЗЕР // Успехи физических наук. -1965. - Vyp. 11. - C. 521-538.
6. L.V. Tarasov, "Fourteen Lectures on Lasers", Moscow-2011, 176 p.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies • Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations	
ECTS allocated based on Student Workload	
Total Workload	**150**
Total Workload/30(h)	**150/30**
ECTS Credits of the Course	**5**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Modern Web Development Tools
Course Unit Code	ATMF-B11
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	2
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Elvin Qurbanov
Name of Lecturer(s)	Elvin Qurbanov
Name of Assistant(s)	-

Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
The Modern Web Programming course covers the steps taken on the front-user and back-server sides and familiarization with relevant technologies for developing web applications (writing programs for the operation of dynamic sites on the World Wide Web), and is intended to teach students important concepts and increase their basic knowledge. It includes sections on the description, explanation of modern concepts used in the web and web programming, and their application and use in modern times.

Course Objectives:
The Modern Web Programming course covers modern web standards for developing interactive websites, technologies used to achieve the set goal on the server and user side. Students are provided with the formation of relevant knowledge, skills and habits, and they master the capabilities of technical tools and software needed to develop dynamic websites.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	The main purpose and capabilities of the web, internet, and web programming	1, 2
2	Formation of ideas about web programming training tools;	1, 2
3	To form an understanding of the goals and objectives of Web programming training for undergraduate students;	1, 2
4	Performing practical tasks used in the training of Web programming course for undergraduate students;	1, 2
5	Formation of ideas about the principles and training methods of web programming training;	1, 2
6	Monitoring and investigating the level of implementation of practical tasks;	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks	4

	and achieve goals	
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	5
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents

Week	Chapter	Topics	Exam
1		Lecture 1.Web technologies, programming languages. Browser	
2		HTML standards. Structure of HTML, element family. Static web pages **Seminar 1**	
3		Lecture 2.Block, inline type tags. Table	
4		Headings, hyperlinks, text formatting elements **Seminar 2**	
5		Lecture 3.Forms and their elements. Transferring data through forms	
6		CSS. Selectors **Seminar 3**	
7		Lecture 4.CSS rules. Inline, block, inline-block elements	
8		Units of measurement, colors in CSS **Seminar 4**	
9		Lecture 5.The concept of edge, distance from the edge and frame	

10		CSS element positioning properties, z-index **Seminar 5**	
11		Lecture 6.Pseudo classes	
12		HTML coding styles. Fixed, "rubber", adaptive coding **Seminar 6**	
13		Lecture 7.Javascript. Login and connection rules	
14		Javascript. Variables, operators, and period operators **Seminar 7**	
15		Javascript. Conditional operator and functions **Seminar 8**	

Recommended Sources

TEXTBOOK(S)

1. Ben Henick. HTML and CSS. Path to perfection. 2011. Peter.
2. John Duckett. HTML & CSS Design and Build websites. John Wiley & Sons, Inc.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**120**
Total Workload/30(h)	**120/30**

ECTS Credits of the Course	**4**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Cryptographic Algorithms in Computer Systems
Course Unit Code	ATMF-B11
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	2
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Minister Sefa Shamil Hayri
Name of Lecturer(s)	Minister Sefa Shamil Hayri
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
The content of the subject "Cryptographic algorithms in computer systems" consists of the history of cryptography, number theory and abstract algebra, classical cryptosystems, block ciphers; DES, AES, Maple applications in classical cryptosystems, public key cryptosystems, RSA, Diffie-Hellman key exchange, El Gamal encryption, Maple applications of public key cryptosystems, Elliptic curves, Elliptic curve encryption system.

Course Objectives:
The purpose of teaching the subject "Cryptographic Algorithms in Computer Systems" is to:To introduce students to the cryptography tools and techniques used to ensure the security and protection of data in the digital world.To teach the basic principles of cryptography, the basics of security applications such as encryption and digital signatures, and to acquire new skills in these topics.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Knows and applies cryptographic concepts	1, 2
2	Knows and applies digital signature techniques	1, 2
3	Knows cryptanalysis techniques and can take necessary measures against cryptanalysis techniques	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3

8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	4
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		**Lesson 1.** The concept of information security. The main components of information security	
2		**Lesson 2.** Overview of cryptography, basic concepts and history of cryptography **Seminar 1.** Basic security measures (Blocking, Detection and Response); General information security objectives; Authentication and Authorization; Security management and policies	
3		**Lesson 3.** Classification of cryptoalgorithms	
4		**Lesson 4.** Requirements for cryptographic systems, formal model of ciphers, strength of ciphers and encryption algorithms **Seminar 2.** Classification criteria for crypto algorithms; Criteria for encryption algorithms	
5		**Lesson 5.** Symmetric and asymmetric encryption algorithms **Seminar 3.** Basic elements of encryption; What cryptology provides; Basic terms and concepts of cryptography; Cryptography and cryptanalysis	
6		**Lesson 6.** Electronic digital signature and hash function **Seminar 4.** Symmetric cryptosystem. Bit-by-bit encryption of files with a scrambler; Asymmetric cryptosystem. RSA algorithm. Public and private key generation	
7		**Lesson 7.** Classical cryptography. Encryption methods - permutation, substitution, gamma and block ciphers; Deff-Hellman algorithm, Caesar cipher algorithm. Vigerine cipher, Caesar cipher, ROT13 Hill cipher, One time pad, Pigpen Cipher, Polybius Cipher, Bifid and Playfair Cipher	
8		**Lesson 8.** Identification and authentication protocols, Zero-knowledge protocol	
9		**Lesson 9.** Network security and public key infrastructure	

10		**Lesson 10.** Installing VMware on a virtual machine **Seminar 5.** Procedure for verifying a digital signature; Properties of a hash function; Procedure for creating a digital signature	
11		**Lesson 11.** Encryption and Decryption on the Kali Linux Platform	
12		**Lesson 12.** Hash identifier **Seminar 6.** Procedure for verifying a digital signature; Properties of a hash function; Procedure for creating a digital signature	
13		**Lesson 13.** Basic concepts of shorthand. Types of shorthand **Seminar 7.** Authentication system criteria; Needham-Schroeder Scheme, Kerberos Protocol	
14		**Lesson 14.** Stenography tools. Stenography algorithms	
15		**Lesson 15.** Types of steganalysis attacks **Seminar 8.** Digital certificates and X.509 certificates, certificate lifetim management; IP Security (IPSec); PKI trust models, PKIX; Installing a virtual machine on a computer; How to manage a virtual machine; How to use the Kali Linux operating system; Software used in the Kali Linux operating system; How to install a Hash identifier on the Kali Linux operating system; Stenography tools;Using shorthand tools	

Recommended Sources

TEXTBOOK(S)

1. G.B. Agnew, “Random Sources for Cryptographic Systems,” Advances in Cryptology—EUROCRYPT '87 Proceedings, Springer–Verlag, 1988, pp. 77–81.
2. Cipher A. Deavours/Louis Kruh, Machine Cryptography and Modern Cryptanalysis. Artech House, Norwood 1985. ISBN 0-89006-161-0.
3. Mohamed Barakat, Christian Eder, Timo Hanke Introduction to Cryptography, 2018

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies • Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations	
ECTS allocated based on Student Workload	
Total Workload	**120**
Total Workload/30(h)	**120/30**
ECTS Credits of the Course	**4**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Data Analytics and Machine Learning
Course Unit Code	ATMF-B12
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hours/week)	2
Practice (hours/week)	2
Laboratory (hours/week)	
Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Ali Muhammedli Mubariz
Name of Lecturer(s)	Ali Muhammedli Mubariz
Name of Assistant(s)	-

Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

Data science is a multidisciplinary field that involves extracting insights and knowledge from large and complex datasets using various techniques, including statistics, machine learning, data mining, and data visualization. It encompasses the processes of collecting, cleaning, analyzing, and interpreting data to solve complex problems and make informed decisions.

Course Objectives:

The purpose of data science is to harness the power of data to extract valuable insights, patterns, and trends that can inform decision-making, optimize processes, and drive innovation across various domains. By leveraging advanced analytical techniques and technologies, data scientists aim to uncover hidden patterns in data, predict future outcomes, and derive actionable insights that can lead to improved business strategies, product development, scientific discoveries, and societal advancements. In essence, data science enables organizations and individuals to turn data into actionable knowledge, ultimately leading to better outcomes and enhanced understanding of the world around us.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	**Comprehensive Understanding**: Students should develop a thorough understanding of the fundamental concepts, theories, and principles underlying data science, including statistics, machine learning, data mining, data visualization, and big data technologies.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5

5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	4
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		**Introduction to Data Science**: Overview of data science, its applications, and its interdisciplinary nature **Seminar 1**	
2		**Data Collection and Preprocessing**: Techniques for acquiring, cleaning, and preprocessing data from various sources **Seminar 2**	
3		**Exploratory Data Analysis (EDA)**: Methods for summarizing, visualizing, and exploring datasets to gain insights and identify patterns **Seminar 3**	
4		**Statistical Analysis**: Basic statistical concepts, probability theory, hypothesis testing, and inferential statistics for data analysis **Seminar 4**	
5		**Machine Learning Fundamentals**: Introduction to supervised, unsupervised, and reinforcement learning algorithms, including linear regression, logistic regression, decision trees, k-nearest neighbors, clustering, and dimensionality reduction **Seminar 5**	
6		**Model Evaluation and Validation**: Techniques for evaluating and validating machine learning models, including cross-validation, performance metrics, and overfitting/underfitting **Seminar 6**	

7		**Feature Engineering**: Methods for selecting, transforming, and engineering features to improve model performance and interpretability **Seminar 7**	
8		**Data Visualization**: Principles and techniques for creating effective visualizations to communicate insights and findings from data **Seminar 8**	
9		**Big Data Technologies**: Overview of big data technologies and frameworks such as Hadoop, Spark, and distributed computing for handling large-scale datasets **Seminar 9**	
10		**Deep Learning**: Introduction to neural networks, deep learning architectures, and convolutional/recurrent neural networks for complex data analysis tasks such as image recognition and natural language processing **Seminar 10**	
11		**Text Mining and Natural Language Processing (NLP)**: Techniques for processing, analyzing, and extracting insights from textual data, including sentiment analysis, topic modeling, and named entity recognition **Seminar 11**	
12		**Time Series Analysis**: Methods for analyzing and forecasting time-series data, including trend analysis, seasonality, and autoregressive models **Seminar 12**	
13		**Dimensionality Reduction**: Techniques such as principal component analysis (PCA) and t-distributed stochastic neighbor embedding (t-SNE) for reducing the dimensionality of data while preserving its structure **Seminar 13**	
14		**Dimensionality Reduction**: Techniques such as principal component analysis (PCA) and t-distributed stochastic neighbor embedding (t-SNE) for reducing the dimensionality of data while preserving its structure **Seminar 14**	
15		**Capstone Project or Case Studies**: Hands-on projects or case studies where students apply data science techniques to real-world datasets or problems, integrating concepts learned throughout the course **Seminar 15**	

Recommended Sources

TEXTBOOK(S)

1. Auelion Geron, Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow, Sebastopol, 2019
2. Andew NG, Machine Learning Yearning, 2020
3. Andrew W. Task, Grokking Deep Learning, New York, 2019
4. Dirk P. Kroese, Zdravko I. Botev, Thomas Taimre, Radislav Vaisman, Data Science and Machine Learning, Electronic resource, 2022

Assessment		
Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload	
Total Workload	**180**
Total Workload/30(h)	**180/30**
ECTS Credits of the Course	**6**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Object Oriented Programming
Course Unit Code	ATMF-B12
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	

Number of ECTS Credits Allocated	6
Theoretical (hours/week)	2
Practice (hours/week)	2
Laboratory (hours/week)	
Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Hasanli Fariz Ramadan
Name of Lecturer(s)	Hasanli Fariz Ramadan
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
Unlike traditional procedural programming, the OOP concept takes into account the possibility of a separate approach to objects, automation of safe code writing, solving performance problems, and taking necessary measures during project development as a team. The codes to be written during project development with Services called SOA are implemented based on the OOP concept.

Course Objectives:
It is a must for every professional who chooses the art of programming as a hobby to master the object-oriented concept. Both web programming, mobile programming, and front-end programming refer to the OOP concept. Therefore, it is necessary for you to learn this subject.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Ability to Work with Services	1, 2
2	Database skills	1, 2
3	Gaining exposure to a real work environment	1, 2
4	Obtaining the basic knowledge necessary for backend and frontend	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to the Program

		CL

1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	4
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. Introduction to the Java programming language, its differences from other languages.Preparing and loading Java environment, JVM, JDK, IDE concepts Seminar 1	
2		Lesson 2. Main method, variable types, arrays Seminar 2	
3		Lesson 3. Conditional operators, periods, general differences in syntax.Object-oriented programming concept and principles Seminar 3	

4		Lesson 4. Class and object concepts and differences. Seminar 4	
5		Lesson 5. Working with files. The principle of inheritance Seminar 5	
6		Lesson 6. Methods, method parameters, return types Seminar 6	
7		Lesson 7. Constructor, Override methods and their essence. String Class, its methods, usage Seminar 7	
8		Lesson 8. The principle of polymorphism (Abstract, Interface) Seminar 8	
9		Lesson 9. Keywords: this, final, static. Encapsulation (public default private protected) Seminar 9	
10		Lesson 10. Error Handling, Exceptions Seminar 10	
11		Lesson 11. Collections. Thread concept, performance optimization Seminar 11	
12		Lesson 12. Dependency, dependencies, Maven, pom.xml Seminar 12	
13		Lesson 13. Working with databases. JDBC driver. Understanding design patterns Seminar 13	
14		Lesson 14. Services, API concept Seminar 14	
15		Lesson 15. Forming the structure of projects, the concept of FrameWork. The concept of Git, online platforms Seminar 15	

Recommended Sources

TEXTBOOK(S)

1. https://www.w3schools.com/java/default.asp
2. https://www.geeksforgeeks.org/object-oriented-programming-oops-concept-in-java

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	

Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload	
Total Workload	**180**
Total Workload/30(h)	**180/30**
ECTS Credits of the Course	**6**

Computer Engineering bachelor program, Department of "Mechanics and Mathematics"

Course Unit Title	Robotics
Course Unit Code	ATMF-B13
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hours/week)	2
Practice (hours/week)	2
Laboratory (hours/week)	
Year of Study	4
Semester when the course unit is delivered	7

Course Coordinator	Rustamova Durdana Farhad
Name of Lecturer(s)	Rustamova Durdana Farhad
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

The subject “Fundamentals of Mechatronics and Robotics” provides information about the application of technology in the fields of electronics, computer applications, programming, and at the same time the rapid development of automation in industrial fields, the creation of intelligent devices and robots and their application in many industrial fields, etc. The necessity of using mechatronic systems in modern production technologies, electric vehicles, scientific research, for example, in the study of the ocean floor, space - the Moon, Mars, is justified. Due to their harmfulness to human health, inaccessibility and complexity, especially in cases where it is impossible for a person to come into contact with research objects, robots-mechatronic systems are widely used in many industrial facilities, for example, in atomic reactors, chemical reactors, and in the detection and destruction of mines. The goal is to introduce the role of the subject "Fundamentals of Mechatronics and Robotics" in science, technology, industry and other fields, to ensure the scientific and methodological preparation of future specialists, to form in them the relevant knowledge, skills and habits for implementing education, to familiarize them with the experience gained in teaching the subject "Fundamentals of Mechatronics and Robotics", and to form the ability to think logically.

Course Objectives:

Ensuring the scientific and methodological preparation of future specialists, forming in them the relevant knowledge, skills and habits for implementing teaching, familiarizing them with the experience gained in teaching the basics of mechatronics and robotics, and forming the ability to think logically.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about the goals and objectives of the subject of mechatronics and robotics as a science, scientific research methods, and its relationship with other sciences;	
2	Formation of ideas about the forms of organizing training in the basics of mechatronics and robotics;	
3	Formation of ideas about the means of teaching the basics of mechatronics and robotics;	
4	Formation of ideas about the principles and training methods of teaching the basics of mechatronics and robotics;	
5	To form an understanding of the goals and objectives of teaching the basics of mechatronics and robotics to undergraduate students;	

6	Performing practical tasks used in the training of undergraduate students in the Fundamentals of Mechatronics and Robotics course;	
7	Monitoring and investigating the level of performance of practical tasks.	

Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	4
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	4
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam

1		Lesson 1. Current status of the engineering specialty of mechatronics and robotics. Status of methods and tools of intelligent control for mobile robots. Interaction of science in the field with other sciences **Seminar 1**	
2		Lesson 2. Information exchange. Classification of signals. Signal processing parameters. Image parameters **Seminar 2**	
3		Lesson 3. Color triangle. Color chart. Collection of colors **Seminar 3**	
4		Lesson 4. Intelligent robot **Seminar 4**	
5		Lesson 5. Increasing the Sensing Rate of Robots **Seminar 5**	
6		Lesson 6. Increasing the intelligence of robots **Seminar 6**	
7		Lesson 7. A systematic approach to the design of mechatronic systems **Seminar 7**	
8		Lesson 8. Stages of designing mechatronic systems **Seminar 8**	
9		Lesson 9. Preparation stage for designing mechatronic systems **Seminar 9**	
10		Lesson 10. Design systems. Basic principles of design **Seminar 10**	
11		Lesson 11. Structure of automated design systems. Types of automated design systems **Seminar 11**	
12		Lesson 12. Designing based on group technology **Seminar 12**	
13		Lesson 13. Mathematical modeling **Seminar 13**	
14		Lesson 14. Imitation modeling **Seminar 14**	
15		Lesson 15. Digital Filters in Information Exchange. Classification of Digital Filters in Information Exchange **Seminar 15**	

Recommended Sources

TEXTBOOK(S)

1. Artemieva T.V. Hydraulics, hydraulic machines and hydropneumohydraulicsвод: Учебник / T.V. Artemieva, T.M. Lysenko, A.N. Rumyantseva, S.P. Stesin. – M.: Academy, 2014. – 352 c.
2. Bogdanov M.R. Applications of GPS/GLONASS: tutorial. пособие/M.P. Bohdanov. - MO., ID "Intellect". 2012. – 136 p.
3. Shahvorostov S.A. Основы автоматизации: учебн. пособие/ C.A. Shahvorostov. – M.: MADI, 2004. - 101 p.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	
Total Workload/30(h)	
ECTS Credits of the Course	

Computer Engineering bachelor program, Department of "Mechanics and Mathematics"

Course Unit Title	Electrical Engineering
Course Unit Code	ATMF-B13
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hours/week)	2
Practice (hours/week)	2
Laboratory (hours/week)	
Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Rustamova Durdana Farhad
Name of Lecturer(s)	Rustamova Durdana Farhad
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
The subject "Electrical Engineering" provides basic information about the basic laws of electrical engineering, methods of analyzing electrical circuits, basic concepts of electric and magnetic circuits, and the operating principles, properties, parameters, and characteristics of devices.
Considering all of this, it is clear that studying electrical engineering is important.

Course Objectives:
The goal and main objective of teaching the subject is to provide future specialists with relevant knowledge about "Electrical Engineering" and to develop in them the ability to effectively use this knowledge in their work. The knowledge acquired will be significantly useful for these specialists in monitoring, maintaining and improving the operation of electronic circuits.

Learning Outcomes

At the end of the course the student will be able to know	Assessment

1	Electrical power sources;	
2	Electrical measuring instruments;	
3	Basic laws of electrical circuits;	
4	An ideal electric circuit with R, L and C elements;	
5	Structure and working principle of transformers;	
6	DC machines	
7	Asynchronous machines;	
8	Synchronous machines	

Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	4
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	4
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	3
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	3

10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. Historical development of electrical engineering. Basic concepts of electrical engineering science. Basic concepts of electric and magnetic circuits Seminar 1	
2		Lesson 2. Basic quantities characterizing electromagnetic processes in electrical circuits Seminar 2	
3		Lesson 3. Electrical power sources. Electrical measuring devices Seminar 3	
4		Lesson 4. Analysis and reporting methods of linear and nonlinear circuits of electrical circuits Seminar 4	
5		Lesson 5. Basic laws of electrical circuits. Ohm's law for a circuit part and a complete circuit. Power balance. Kirchhoff's laws Seminar 5	
6		Lesson 6. Operating modes of an electrical circuit. Combination forms of resistances and their reporting forms Seminar 6	
7		Lesson 7. Ideal R, L, and C element electric circuit Seminar 7	
8		Lesson 8.Voltage resonance. Power triangle Seminar 8	
9		Lesson 9.Single-phase alternating current circuits. Three-phase alternating current circuits Seminar 9	
10		Lesson 10. Magnetic circuits. Basic laws of magnetic circuits Seminar 10	
11		Lesson 11. Transformers. Structure and working principle of transformers. Types of transformers. Three-phase transformers. Autotransformers. Current measuring transformers. Voltage measuring transformers Seminar 11	

12		Lesson 12. General information about synchronous machines. Synchronous generators and tachogenerators, parallel operation of synchronous generators. Synchronous jet engines Seminar 12	
13		Lesson 13. The structure and principle of operation of asynchronous machines. Three-phase asynchronous motor. Starting and speed regulation of an asynchronous motor Seminar 13	
14		Lesson 14. Structure, working principle and application areas of DC machines. Methods of influencing DC machines. Reversing DC motors. Collector. Anchor Seminar 14	
15		Lesson 15. Semiconductor electronic elements used in electrotechnical devices and products. Working principle of devices used in electrotechnical devices Seminar 15	

Recommended Sources

TEXTBOOK(S)

1. Abdullayev N.D., Ismayilov K.G., Abdulgadirov A.I. “Testing and reliability of electric machines” Baku-1990
2. Abdullayev Y.R. “Electrical and electronic devices” Baku, Military Publishing House, 1999 (Part I)
3. Abdullayev Y.R. “Electrical and electronic devices” Baku, Military Publishing House, 1999 (Part II)
4. Osmanov S.C., Gasimova T.C. “Electrical machines” (Part I) Baku-2007
5. Osmanov S.C., “Electrical machines” (Part II) Baku-2010

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies • Attendance of the course is mandatory. • Late assignments will not be accepted unless an agreement is reached with the lecturer. • Students cannot use calculators during the exam. • Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations	
ECTS allocated based on Student Workload	
Total Workload	**180**
Total Workload/30(h)	**180/30**
ECTS Credits of the Course	**6**

Computer Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Internet Technologies
Course Unit Code	ATMF-B14
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	2
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Mustafayeva Sabina Fazil
Name of Lecturer(s)	Mustafayeva Sabina Fazil
Name of Assistant(s)	-

Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
"Internet technologies" course functional-structure of a personal computer organization, information management device, information display device covers sections, intended to teach students important concepts and basic knowledge. Course consists of theoretical and seminar classes. All technical terms are described and explained here Sections on its application and use in modern times are reflected.

Course Objectives:
Modern technical tools in the Internet technologies course learning and use are widely applied. That's why he studied in the appropriate directions, future specialists must master the capabilities of technical tools

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Objectives and tasks of "Internet technologies" teaching methodology science, scientific research methods, formation of ideas about their relationship with other sciences;	1, 2
2	Ideas about the forms of organization of "Internet technologies" training formation;	1, 2
3	Forming ideas about the tools of "Internet technologies "training	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	4
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall	5

	performance and reliability of systems	
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	4
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	4
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. Introduction to Internet technologies **Seminar 1**	
2		Lesson 2. Development stages of Internet technologies	
3		Lesson 3. Local and global networks. Network protocols **Seminar 2**	
4		Lesson 4. Network operating systems	
5		Lesson 5. Internet services: FTP, Email. WWW **Seminar 3**	
6		Lesson 6. Multimedia technology, ILC, USENET, Skype	
7		Lesson 7. Law of the Republic of Azerbaijan on Electronic Government. Electronic document circulation **Seminar 4**	
8		Lesson 8. Internet security and privacy. Data encryption. HTTPS	
9		Lesson 9. Using information resources in education **Seminar 5**	
10		Lesson 10. Classification of electronic educational resources	

11		Lesson 11. Distance education. Organization and directions of distance education **Seminar 6**	
12		Lesson 12. Development prospects of Internet technologies	
13		Lesson 13. Differences between Internet service providers on a global scale, methods of connecting to the Internet **Seminar 7**	
14		Lesson 14. Classification of Internet technologies.	
15		Lesson 15. The role of Internet technologies in information and communication technologies **Seminar 8**	

Recommended Sources

TEXTBOOK(S)

1. Rustamov A.M. Informatics: a resource for personal education. Baku, 2012.521p

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**120**

Total Workload/30(h)	**120/30**
ECTS Credits of the Course	**4**

Computer Engineering bachelor program, Department of "Programming and Information Security"

Course Unit Title	Industrial production managment
Course Unit Code	ATMF-B14
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hours/week)	2
Practice (hours/week)	1
Laboratory (hours/week)	
Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Aliyev Goshgar Seyfullah
Name of Lecturer(s)	Aliyev Goshgar Seyfullah
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

The subject "Structured Programming" is included in the block of general professional subjects. The course teaches the process of solving problems on a computer; learning and mastering basic programming methods and techniques (structured); acquiring basic skills in debugging and testing programs. It mainly studies data structures in programming languages; programming methods and methods for developing effective algorithms for solving applied problems; modern tools for developing and analyzing software in high-level languages. Therefore, future specialists studying in the relevant areas should master this subject.

Course Objectives:

Teaching the subject “Structured Programming” together with other technical subjects allows students to reveal their intellectual potential and form creative personalities who successfully function in the system of modern requirements. The objectives of the subject “Structured Programming” are: to introduce basic concepts in the field of programming; to introduce programming paradigms; to form an understanding of the main stages of solving problems using a computer; to develop knowledge about the principles of organizing data in computer memory, the main types of data in algorithmic programming languages; to study the main algorithmic constructions and their implementation in a programming language; to master the main methods and techniques of programming using the tools of a structured programming language.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	should use the tools of a structured programming language	1, 2
2	should introduce programming paradigms	1, 2
3	should develop	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	4
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	4
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	5
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	4

6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	4
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	3
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	4
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields	5
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	3

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Lesson 1. Introduction to “Structured Programming” **Seminar 1**	
2		Lesson 2. Programming Methodologies. Basic Concepts and Definitions	
3		Lesson 3. The concept of programming methodologies and their types **Seminar 2**	
4		Lesson 4. Procedural programming methodology	
5		Lesson 5. Structured programming methodology **Seminar 3**	
6		Lesson 6. Software development tools	
7		Lesson 7. Basic concepts of programming language **Seminar 4**	
8		Lesson 8. Basic software development tools	
9		Lesson 9. Programming environment and its components **Seminar 5**	
10		Lesson 10. Data Structuring	
11		Lesson 11. Structuring Algorithms **Seminar 6**	
12		Lesson 12. The concept of an algorithm and its properties	

13		Lesson 13. Language forms of algorithm presentation **Seminar 7**	
14		Lesson 14. Algorithm description with flowcharts	
15		Lesson 15. Project Structuring **Seminar 8**	

Recommended Sources

TEXTBOOK(S)

1. Koldaev, V. D. Fundamentals of algorithmization and programming: textbook / V. D. Koldaev; under the editorship prof. L. G. Gagarin. – Moscow: FORUM: ИНФРА-М, 2021. – 414 с. – https://znanium.com/read?id=361059 – Access mode: under subscription ТюмГУ.
2. Friesen, I. G. Fundamentals of algorithms and programming (PascalABC.NET environment): textbook / I.G. Friesen. - Moscow: ФОРУМ: ИНФРА-М, 2020. - 392 с. - URL: https://znanium.com/read?id=345722 - Access mode: under subscription ТюмГУ.
3. Rogov A.Yu. Basics of procedural-structural programming: textbook / A.Ю. Rogov, V.I. Halimon, O.V. Sorry. – SPb.: SPbГТИ (ТУ), 2014. – 104 p.
4. Russell, J. Structural programming. / Jesse Russell, Ronald Cohn - per. с Англ.- М.: VSD, 2013.- 101 с.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**120**

Total Workload/30(h)	**120/30**
ECTS Credits of the Course	**4**

Computer Engineering bachelor program

Course Unit Title	Internship
Course Unit Code	
Type of Course Unit	Compulsory
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	30
Theoretical (hours/week)	
Practice (hours/week)	
Laboratory (hours/week)	
Year of Study	4
Semester when the course unit is delivered	8
Course Coordinator	Sabina Ibrahimova
Name of Lecturer(s)	-
Name of Assistant(s)	-
Mode of Delivery	Face to Face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-
Course description: A key stage of study where students apply theoretical knowledge into internship by participating in real projects under the guidance of experienced mentors.	

Course Objectives:
To prepare students for independent professional activity, developing practical skills and professional competencies.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Consolidation and application of theoretical knowledge	1
2	Mastering practical skills	1
3	Formation of professional competencies	1
4	Understanding the manufacturing process	1
5	Development of independence	1
6	Creating a portfolio	1

Assessment Methods: 1. Internship Report

Course's Contribution to the Program

		CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields	5
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology	5
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals	5
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries	5
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems	5
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices	5
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields	5
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems	5
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the	5

	impact of engineering decisions in various fields	
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech	4

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Assessment

Internship Report	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Total Workload	**900**
Total Workload/30(h)	**900/30**
ECTS Credits of the Course	**30**

Computer Engineering bachelor program, Department of "Information Technologies""

Course Unit Title	Planning and Design of Scientific Research
Course Unit Code	ATMF -B13
Type of Course Unit	Selection
Level of Course Unit	4 nd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Hajiyeva R.
Name of Lecturer (s)	Hajiyeva R.
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
This course teaches students the main stages of scientific research—from identifying a problem to selecting methods, analyzing data, and presenting results scientifically—in a systematic way. The course develops both theoretical knowledge and practical skills.

Objectives of the Course:
The aim of the course is to provide students with fundamental and applied knowledge in planning, designing, conducting, and analyzing the results of the scientific research process, and to develop their ability to carry out scientific investigations.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1.	Can explain the fundamentals of scientific methodology.	1, 2
2.	Can formulate a research problem and hypothesis.	1, 2

3.	Has the ability to conduct a literature review and evaluate sources.	1, 2
4.	Can choose and justify different research designs.	1, 2
5.	Can develop a sampling strategy, data collection plan, and analysis plan.	1, 2
6.	Can design research in accordance with ethical principles.	1, 2
7.	Visualizes and interprets data and writes a scientific report.	1,2
8.	Explains the key principles of research reliability and reproducibility.	1,2

Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz

Course's Contribution to Program

		CL
1.	To teach students the essence of the scientific method and the main elements of research.	
2.	Skills in effective literature search and source evaluation.	
3.	Ability to recognize design types and choose an appropriate design.	
4.	Learning to plan sample size and sampling methods.	
5.	Teaching data collection methods and the reliability of instruments.	
6.	Applying ethical principles and legal requirements.	
7.	Introduction to basic statistical analyses and interpretation of results.	

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Introduction to Scientific Research Methodology	
2		Literature Review and Working with Scientific Sources	
3		Research Design and Experiment Planning	
4		Sample Selection and Statistical Planning	
5		Data Collection Methods	
6		Ethical and Legal Requirements in Scientific Research	
7		Analysis and Interpretation of Research Data	
8		Preparation of Scientific Reports and Publications	
9		Structure and Planning of a Research Project	

10		Qualitative and Quantitative Research Methods	

Recommended Sources TEXTBOOK(S)

1. Creswell, J. W. *Research Design*.
2. Kothari, C. R. *Research Methodology*.
3. Sekaran, U., Bougie R. *Research Methods for Business*.
4. Higgins & Green. *Cochrane Handbook for Systematic Reviews*.
5. Field, A. *Discovering Statistics Using SPSS/R*.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

Attendance of the course is mandatory.

Late assignments will not be accepted unless an agreement is reached with the lecturer.

Students cannot use calculators during the exam.

Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class			
Presentation			
Self-study			
Tutorials			
Midterm Examination			
Preparation for midterm exam			
Final Examination			
Preparation for final exam			
Total Workload			90
Total Workload/30(h)			90\30
ECTS Credit of the Course			3

Computer Engineering bachelor program, Department of "Information Technologies"'"

Course Unit Title	Research Methods and Ethics
Course Unit Code	ATMF-B13
Type of Course Unit	Selection
Level of Course Unit	4 nd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Hajiyeva R.
Name of Lecturer (s)	Hajiyeva R.
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
This subject teaches students the main methods of scientific research, the quantitative and qualitative approaches used in the research process, data collection strategies, data analysis, and the principles of research ethics. It also covers topics such as ethics committee requirements, research involving human and animal subjects, data confidentiality, and responsible scientific conduct.

Objectives of the Course:
To teach students the skills of planning scientific research, choosing appropriate methods, considering ethical issues, and adhering to standards of scientific conduct; and to ensure that research is carried out correctly, safely, and reliably.

Learning Outcomes

At the end of the course the student will be able to	Assessment

1	Explains the fundamental principles of research methods and selects appropriate methods.	1, 2
2	Formulates the research problem, objective, and hypothesis.	1, 2
3	Identifies and applies the differences between qualitative and quantitative research.	1, 2
4	Understands human subjects, animal ethics, and bioethical standards.	1, 2
5	Explains the procedures for applying to ethics committees.	1, 2
6	Applies ethical principles in data collection and processing.	1, 2
7	Acts in accordance with “Responsible Conduct of Research (RCR)” guidelines.	1,2
8	Prevents plagiarism, data fabrication, and other ethical violations.	1,2

Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz

Course’s Contribution to Program

		CL
1.	Scientific method, research stages, types of research.	
2.	Problem formulation, research question, structure of a hypothesis.	
3.	Interviews, focus groups, observation, thematic analysis.	
4.	Experiments, surveys, introduction to statistical analysis.	
5.	Sequential and concurrent designs; triangulation.	
6.	Experimental, cross-sectional, cohort, and case-study designs.	
7.	Survey design, measurement instruments, validity and reliability.	
8.	History of ethics, bioethics, scientific integrity.	

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1		Introduction to Research Methods and the Scientific Approach	
2		Problem Definition, Objectives, and Hypothesis	
3		Qualitative Research Methods	

4		Quantitative Research Methods	
5		Mixed Methods	
6		Research Design and Method Selection	
7		Data Collection and Instrument Reliability	
8		Introduction to Ethics and Principles of Scientific Conduct	
9		Application Process for Research Ethics Committees	
10		Ethical Dissemination of Research Findings	

Recommended Sources TEXTBOOK(S)

1. Creswell, J. W. — *Research Design*.
2. Kothari, C. R. — *Research Methodology: Methods and Techniques*.
3. Shamoo E., Resnik D. — *Responsible Conduct of Research*.
4. ICMJE Recommendations (International Committee of Medical Journal Editors).
5. COPE — Committee on Publication Ethics Guidelines.
6. Macrina, F. — *Scientific Integrity: Text and Cases in Responsible Conduct of Research*.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload

Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class			
Presentation			
Self-study			
Tutorials			
Midterm Examination			
Preparation for midterm exam			
Final Examination			
Preparation for final exam			
Total Workload			90
Total Workload/30(h)			90\30
ECTS Credit of the Course			3

Computer Engineering bachelor program, Department of "Information Technologies""

Course Unit Title	**Scientific Writing and Publication Processes**
Course Unit Code	ATMF-B13
Type of Course Unit	Selection
Level of Course Unit	4 nd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Hajiyeva R.
Name of Lecturer (s)	Hajiyeva R.
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
This course provides students with theoretical and practical knowledge on scientific writing style, the structure of scientific articles, working with literature, journal selection, digital tools, and the stages of the publication process. The course develops both writing skills and the effective presentation of scientific findings.

Objectives of the Course:
To teach students the skills to prepare scientific articles and reports, create scientific tables and graphs, justify results, submit articles to high-impact journals, and participate in the competitive peer-review process.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1.	Can explain the fundamental principles of scientific writing style.	1, 2

2.	Can apply the structure of a scientific article (IMRAD).	1, 2
3.	Has the ability to write clearly, logically, and accurately in academic language.	1, 2
4.	Prepares graphs, tables, and visual materials in accordance with scientific standards.	1, 2
5.	Can work with journal selection, publication guidelines, and ethical norms.	1, 2
6.	Understands the peer-review process and can write a response letter.	1, 2
7.	Can prepare grant proposals, posters, and scientific presentations.	1,2

Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz

Course's Contribution to Program

		CL
1.	Characteristics of academic language: objectivity, accuracy, logical coherence, and style of expression.	
2.	Introduction, Methods, Results, Discussion structure; standard sections of an article.	
3.	Problem statement, literature gap, objectives, and hypothesis.	
4.	Description of research design, sample selection, tools used, and protocols.	
5.	Graphs, tables, descriptive statistics, and principles of visual design.	
6.	Interpretation of results, limitations, and directions for future research.	
7.	Structured and unstructured abstracts; effective selection of keywords.	
8.	APA, MLA, Vancouver, Harvard styles; reference management software (Zotero, Mendeley).	
9.	Generic and specialized journals, indexing (Scopus, WoS), Impact Factor, Q1–Q4.	

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam

1		Introduction to Scientific Writing and Academic Style	
2		Overall Structure of a Scientific Article (IMRAD)	
3		Writing the Introduction Section and Formulating the Problem	
4		Writing the Methods Section	
5		Writing the Results and Preparing Graphs	
6		Discussion Section and Scientific Interpretation	
7		Grant Proposals and Project Applications	
8		References and Citation Systems	
9		Journal Selection and Publication Strategies	
10		Open Science, Preprints, and Scientific Communication	

Recommended Sources TEXTBOOK(S)

1. Day, R. A., Gastel, B. *How to Write and Publish a Scientific Paper*.
2. Glasman-Deal, H. *Science Research Writing*.
3. Cargill, M., O'Connor, P. *Writing Scientific Research Articles*.
4. Wallwork, A. *English for Writing Research Papers*.
5. COPE Guidelines for Publication Ethics.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

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ECTS allocated based on Student Workload

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Tutorials			
Midterm Examination			
Preparation for midterm exam			
Final Examination			
Preparation for final exam			
Total Workload			90
Total Workload/30(h)			90\30
ECTS Credit of the Course			3