MODULE HANDBOOK

BSc in Device Engineering

CONTENTS

Device 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	1st year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/week)	-
Year of Study	1
Semester when the course unit is delivered	2
Course Coordinator	Ph.D. Gunel Rahimli Ashraf
Name of Lecturer (s)	Ph.D. Gunel Rahimli Ashraf
Name of Assistant (s)	-
Mode of Delivery	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.

Objectives of the Course:
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	to 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	to connect historical events with modern times, to draw conclusions	1, 2
5	to apply the methods of comparative analysis, analysis and synthesis	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	2
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	2
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 PREHİSTORY TİME Seminar 1	

2		ANCİENT STATES İN AZERBAİJAN. MANNA, ATROPATENA, ANCIENT ALBANIA Seminar 2	
3		AZERBAIJAN IN THE III-VII CENTURES 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 CENTURES Seminar 6	
7		AZERBAIJAN SAFAVID STATE Seminar 7	
8		KHANATES OF AZERBAIJAN Seminar 8	
9		AZERBAIJAN IN THE XIX CENTURES 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. Red. M. Abdullayev. Baku, 2015, 2019 412 p.

2. The History of the Caucasian Albanians" by Movses Khorenatsi (translated by R. W. Thomson)

3. Azərbaycan tarixi üzrə qaynaqlar. S.S. Əliyarov və Y.M. Mahmudovun redaktəsi ilə. Bakı, Çıraq, 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

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

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

Course Unit Title	Business and Academic Communication in a Foreign Language-1
Course Unit Code	ÜF-BO2.01
Type of Course Unit	Compulsory
Level of Course Unit	1st year
National Credits	
Number of ECTS Credits Allocated	7
Theoretical (hour/week)	-
Practice (hour/week)	7

Laboratory (hour/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)	-
Mode of Delivery	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.

Objectives of the Course:

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 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 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
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 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	2
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	2
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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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	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 skill; 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 skill**; 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 Skil	
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 skill;** 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 V 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 skill**; 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		**Unit 8. Public Health -Reading 2;** Critical Thinking Strategy; Vocabulary Skill	
46		**Unit 8. Public Health -Writing skill**; Grammar Adverbs of manner and degree; Unit assignment	
47		**Unit 8. Public Health**: **Listening 1;** Note-taking Skill, Listening Skill, Critical Thinking Strategy; Listening 2; Work with the video; Vocabulary Skill	
48		**Unit 8. 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%	
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ECTS allocated based on Student Workload

Total Workload	**210**

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

Device 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 (hour/week)	-
Practice (hour/week)	8
Laboratory (hour/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)	-
Mode of Delivery	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 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 Program

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

Course Contents

Week	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. Is first impression accurate?** Note-taking Skill: to summarize a lecture Listening 1: The psychology of first impressions.	
6		**Unit 1. Sociology. Is first impression accurate?** Listening Skill: Listening for main ideas. Listening 2: A review of books about first impression.	
7		**Unit 1. Sociology. Is first impression accurate?** Work with the video: Interview mistakes. Vocabulary skill: suffixes. Grammar: Auxiliary verbs: do, be, have	
8		**Unit 1. Sociology. Is first impression 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 understant 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 defence 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: Referents 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 models. 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+preposions	
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 2: Third Edition / Joe McVeigh/ Jennifer Bixby / Oxford University Press, 2020
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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

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 Credit of the Course	**8**

Device 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 (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	-
Year of Study	2
Semester when the course unit is delivered	3
Course Coordinator	Gunel Mustafayeva Nuraddinovna
Name of Lecturer (s)	Gunel Mustafayeva Nuraddinovna
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.

Objectives of the Course:
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	To formulate modern approaches to the study of natural and social phenomena	1, 2
2	The ability to collect and analyze empirical data	1, 2
3	The rules for compiling scientific work	1, 2
4	The ability to generalize and analyze the results of research	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation		
Course's Contribution to 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	2
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	2
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		Introduction to Course. A VERY Brief Discourse to the Main Philosophical Currents. Seminar 1	
2		Introduction to Course. A VERY Brief Discourse to the Main Philosophical Currents. Seminar 2	
3		Main Philosophical Concepts I: Being, Personal Identity, Body/Soul Seminar 3	
4		Main Philosophical Concepts II: Being, Personal Identity, Body/Soul Seminar 4	

5		Main Philosophical Concepts II: Being, Personal Identity, Body/Soul Seminar 5	
6		Main Philosophical Concepts III: Free will Seminar 6	
7		Main Philosophical Concepts III: Free will Seminar 7	
8		Argumentation theory and philosophy. Logical fallacies Seminar 8	
9		Argumentation theory and philosophy. Logical fallacies Seminar 9	
10		Introduction to Political Philosophy Seminar 10	
11		Introduction to Political Philosophy Seminar 11	
12		Labor and Property Seminar 12	
13		Labor and Property Seminar 13	
14		Minds, Brains and Computers (Artificial Intelligence) Seminar 14	
15		Philosophy and the Ecological problems Seminar 15	

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%**	**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 Credit of the Course	**3**

Device 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 (hour/week)	-
Practice (hour/week)	3
Laboratory (hour/week)	-
Year of Study	1
Semester when the course unit is delivered	1
Course Coordinator	Ələsgərova Solmaz Həşim
Name of Lecturer (s)	Ələsgərova Solmaz Həşim
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani

Prerequisites	-
Recommended Optional Program Components	-

Course description:
The subject "Business and Academic Communication in Azerbaijani" arose on the basis of a certain need and demand. In the context of globalization, in order to correctly and freely use the Azerbaijani language in accordance with the requirements of the time, as well as to prepare a smooth speech in this language regardless of specialization, impeccable transmission of thoughts, it is necessary to deeply know its phonetic, lexical and grammatical rules and norms and competently apply them in written and oral speech. The subject is taught in the form of practical classes.

Objectives of the Course:
Within the framework of this subject, special attention should be paid to instilling in students the skills of giving presentations in the Azerbaijani language, public speaking, 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 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	2
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	2
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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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	4
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	
2		Seminar 2. Speech culture and the art of oratory. The relationship of the art of oratory with other sciences 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	
4		Seminar 5. Discussion and listening culture. Ethical issues of speech. Speech etiquette Seminar 6. Expressive actions that complement oral speech. Body language. Mimicry, gesture	
5		Seminar 7. Literary language. Norms of literary language. Phonetic norm. Expectation of orthographic norms in academic and business communication. Abbreviations. Punctuation marks	
6		Seminar 8. Observance of orthoepic norms in academic and business communication. Expressiveness of speech. Stress, intonation Seminar 9. Lexical norm. Expectation of lexical norm in academic and business communication. Use of terms, synonyms, idioms, etc.	
7		Seminar 10. Grammatical norm. Expectation of grammatical norms in academic and business communication. Inversion. Use of descriptive and expressive means of language in academic speech (ellipsis, rhetorical questions, exclamation, etc.)	
8		Seminar 11. Auxiliary parts of speech, their stylistic possibilities in speech Seminar 12. Types of speech: dialogical speech, monological speech, polylogical speech	
9		Seminar 13. Basic requirements for cultural speech	
10		Seminar 14. Style and stylistics. Functional styles of the Azerbaijani language 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 journalistic style	
12		Seminar 17. Official-business style: business correspondence, rules for writing business documents Seminar 18. Preparation of business advertisements and billboards	
13		Seminar 19. Epistolary style: rules for official and electronic correspondence. Business correspondence	
14		Seminar 20. Areas of the art of public speaking Seminar 21. Academic oratory. Business rhetoric. Correct construction of business and academic speech	
15		Seminar 22. The procedure and content of CVs. 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. Xəlilov Buludxan. Azərbaycan dilində işgüzar və akademik kommunikasiya. Bakı, 2021
2. Şiriyev Fikrət. Azərbaycan dilinin nitq mədəniyyəti və kommunikasiya. Bakı, 2021
3. Babayev Adil. Azərbaycan dili və nitq mədəniyyəti. Bakı, 2011
4. Məmmədli N. Azərbaycan dilində işgüzar və akademik kommunikasiya. Bakı, 2021
5. Abdullayev Nadir. Nitq mədəniyyətinin əsasları. Bakı, 2013
6. Fətəliyeva V. Ana dilində ünsiyyət. Bakı, 2021
7. Bayramov R. Sözünə güvən. Bakı, 2016
8. Novarro Co, Karlins Marvin. Bədən dili. Bakı, 2015
9. Qurbanov A.M. Müasir Azərbaycan ədəbi dili. Bakı, 2003
10. Dəmirçizadə Ə. Müasir Azərbaycan dili I hissə. Fonetika, orfoepiya, orfoqrafiya. Bakı, 2007
11. Cəfərov S. Müasir Azərbaycan dili. II hissə. Leksika. Bakı, 2007
12. Hüseynzadə M. Müasir Azərbaycan dili. III hissə. Morfologiya. Bakı, 2007
13. Abdullayev Ə., Seyidov Y., Həsənov A. Müasir Azərbaycan dili. IV hissə. Sintaksis. Bakı, 2007
14. Q. Mustafayeva. Azərbaycan dilinin üslubiyyatı. Bakı, 2010
15. Süleyman Hüseynov, Elvira Qaracayeva. Azərbaycan dili və nitq mədəniyyəti (dərslik), Bakı 2016
16. Əbdülhəsənli T.Ə., Zülfüqarlı (Hüseynova) S.R, Rzai A.R. Azərbaycan dili və nitq mədəniyyəti, Bakı, 2014
17. Deyl Karnegi. Dostu necə qazanmalı və insanlara necə təsir etməli. Bakı, 2007
18. Balakişiyev Ş., Namazov İ. Əməli yazı nümunələri. Bakı, 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 Credit of the Course	**4**

Device 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 (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	-
Year of Study	2
Semester when the course unit is delivered	3
Course Coordinator	Elvin Xudaverdiyev Elshan
Name of Lecturer (s)	Elvin Xudaverdiyev Elshan
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-
Course description: Multiculturalism introduction to the subject of different cultures, ethnic groups and social identities combination of existence and mutual connection, learning a single lesson. This subject provides students, in contrast to the cultures, values, customs and world encounters information about gives, while at the same time multiculturalism, social, political and economic aspects explores.	

Objectives of the Course:
Multiculturalism introduction of the subject goal, different cultures and ethnic groups, relationships to understand, realize the value of cultural diversity and promote social harmony. These subject covers students, principles of multiculturalism, cross-cultural communication and integration processes along with learning, social justice, equality and human rights, questions and discussions. As a result, students who have positive relationships between different cultures will contribute to the development of knowledge and skills they master.

Learning Outcomes

At the end of the course the student will be able to		**Assessment**
1	Multiculturalism subject introduction results of cultures to, empathy and respect growth	1, 2
2	Development of tolerance, social knowledge	1, 2
3	Reinforcement, integration and social harmony assistance to examiners	1, 2
4	As well as critical thinking skills to develop covers	1, 2
5	Improvement of communication skills	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	2
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	2
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	4

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		Lecture1.Multiculturalism introduction of the subject on the subject and meaning	
2		Seminar 1. Multiculturalism introduction of the subject on the subject and meaning	
3		Lecture 2. Religious diversity. Religions, the essence and its manifestations. Forms	
4		Seminar 2. Religious diversity. Religions, the essence and its manifestations. Forms	
5		Lecture 3.World religions	
6		Seminar 3. World religions	
7		Lecture 4. National Religions	
8		Seminar 4. National Religions	
9		Lecture 5. Ethnic diversity and national ideas	
10		Seminar 5. Ethnic diversity and national ideas	
11		Lecture 6. Multiculturalism of ethno-cultural diversity, regulation of effective policies, as a model	
12		Seminar 6. Multiculturalism of ethno-cultural diversity, regulation of effective policies, as a model	
13		Lecture 7. Multiculturalism in Western countries of ethno-cultural diversity and its regulation in the Modern Era	
14		Seminar 7. Multiculturalism in Western countries of ethno-cultural diversity and its regulation in the Modern Era	
15		Lecture 8. Multiculturalism in Azerbaijan in the Modern Era Seminar 8. Multiculturalism in Azerbaijan in the Modern Era	

Recommended Sources TEXTBOOK(S)

1. Quliyev, R. (2015). Multikulturalizmin əsasları.
2. Xudaverdiyev Elvin- Azərbaycanın multikulturalizm siyasəti (2023)
3. Məmmədov, A. (2018). Azərbaycan cəmiyyətində multikulturalizm.
4. Əliyeva, S. (2020). Mədəni müxtəliflik və sosial harmoniya.
5. Kymlicka, W. (1995). Multicultural Citizenship: A Liberal Theory of Minority Rights.
6. Taylor, C. (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 Credit of the Course	**3**

Device Engineering bachelor program, Department of "Philosophy"

Course Unit Title	Sociology
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 (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	-
Year of Study	2
Semester when the course unit is delivered	3
Course Coordinator	Qasımov Azer Ali
Name of Lecturer (s)	Qasımov Azer Ali

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

Course description:

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 to gain a deeper understanding of the events occurring in society.

Sociology studies the behavior of people in the social world, the formation of social relations, 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, economy, and politics) in the formation of society, to help students understand how social processes occur and the impact of social change on individuals and groups.

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

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.

Objectives of the Course:

To teach students the basic concepts, theoretical directions and research methods of sociology. To explain the functions of social institutions (family, education, religion, economy and politics) and their role in society. To provide 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.

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. They will be able to conduct empirical research using social research methods (surveys, interviews, observation, etc.).	1, 2
2	They will develop the ability to analyze social phenomena and processes with a scientific approach. 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 acquired in social policy, business, media and other fields	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	2
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	2
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	3
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		Lecture 1. Sociology as science	
2		Seminar 1. Sociology as science	
3		Lecture 2. Society as a complex social phenomenon	
4		Seminar 2. Society as a complex social phenomenon	
5		Lecture 3. Personality as a social system	
6		Seminar 3. Personality as a social system	
7		Lecture 4. Concept of social structure	
8		Seminar 4. Concept of social structure	

9		Lecture 5. Sociology of social ethnic relations	
10		Seminar 5. Sociology of social ethnic relations	
11		Lecture 6. Social territorial associations	
12		Seminar 6. Social territorial associations	
13		Lecture 7. Religion and Sociology	
14		Seminar 7. Religion and Sociology	
15		Education and Sociology Seminar 1. Education and Sociology	

Recommended Sources TEXTBOOK(S)

1. Giddens, A. (2009). *Sociology*. Polity Press.
2. Macionis, J. J. (2018). *Sociology*. Pearson.
3. Ritzer, G. (2021). *Sociological Theory*. McGraw-Hill.
4. Haralambos, M., & Holborn, M. (2013). *Sociology: Themes and Perspectives*. Collins.
5. Berger, P. L., & 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 Credit of the Course	**3**

Device 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	2nd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/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	
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 the formation of the legal system in Azerbaijan.	
Objectives of the Course: 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 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	2
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	2
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		Lecture 1. Concept, structure and stages of development of the Constitution of the Republic of Azerbaijan	
2		Seminar 1. Concept, structure and stages of development of the Constitution of the Republic of Azerbaijan	

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

Recommended Sources TEXTBOOK(S)

1. Azərbaycan Respublikasının Konstitusiyası
2. S.S. Allahverdiyev. Azərbaycan Respublikası Konstitusiyasının və hüququn əsasları. Dərslik. Bakı, 2012
3. Red. V.V. Lazarev. Ümumi hüquq və dövlət nəzəriyyəsi. Bakı, 2007
4. S.S. Allahverdiyev. Azərbaycan Respublikası Konstitusiyasının və hüququn əsasları. Dərslik. Bakı, 2010
5. Frederik Bastiat. Hüquq. Bakı, 2007
6. Azərbaycan Respublikasının "Normativ hüquqi aktlar haqqında" Konstitusiya Qanunu. Bakı., 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 Credit of the Course	**3**

Device 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	
Semester when the course unit is delivered	3
Course Coordinator	Gunel Mustafayeva Nureddinovna
Name of Lecturer(s)	Gunel Mustafayeva Nureddinovna
Name of Assistant(s)	-
Method 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 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	3
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	2
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	2
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	3
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	2

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		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**

Device 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 (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	-
Year of Study	2
Semester when the course unit is delivered	3
Course Coordinator	Gunel Mustafayeva Nuraddinovna
Name of Lecturer (s)	Gunel Mustafayeva Nuraddinovna
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 in the course of history; it allows students to gain knowledge about the main ethical theories existing 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.

Objectives of the Course:
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	1, 2
2	Creates a complete picture of the essence of morality and classifies its main functions	1, 2

3	Emphasizes the importance of maintaining objectivity in the study of the history of ethical thought	1, 2
4	Applying the acquired theoretical knowledge in professional and everyday activities	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	2
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	2
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	4
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		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		Ethical principles in professional activity Seminar 8. Ethical principles in professional activity	

Recommended Sources

TEXTBOOK(S)

1. Qızılgül Abbasova. Etika: tarix, nəzəriyyə və təcrübə (dərs vəsaiti). Bakı, 2016
2. Sevinc Şahhüseynova, Etika, Bakı, 2009
3. Aristotel, Siyasət. Böyük etika, Bakı, 2006
4. Nəsirəddin Tusi, Əxlaqi Nasiri, Bakı, 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 Credit of the Course	**3**

Device Engineering bachelor program, Department of "Information Technologies"

Course Unit Title	Information Technology (by speciality)
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 (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 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:
Formation of relevant knowledge, skills and habits in students, ensuring their preparation for work on a computer.

Objectives of the Course:
Providing scientific and methodological training of future specialists (goals and content of computer science training, forms of organization of training, methods and means, modern training technologies), formation of relevant knowledge, skills and habits in them for the implementation of education, familiarization with the accumulated experience in teaching computer science, formation of 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 Informatics as a science, scientific research methods, and its relationship with other sciences	1, 2
2	Formation of ideas about the forms of organizing Informatics training	1, 2
3	Formation of ideas about the means of Informatics training	1, 2
4	Formation of ideas about the principles of Informatics training, training methods	1, 2
5	Formation of ideas about the goals and objectives of Informatics training for undergraduate students	1, 2
6	Performance of practical tasks used in the training of Informatics course for undergraduate students	1, 2
7	Control and investigation of the level of implementation of practical tasks	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	3
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	4
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	4
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3
6	ability to use various types of devices to monitor and control technological processes	3
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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	5
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	3
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		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 the 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. Mathematical, statistical, financial, text, logical and other category functions	
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. Hacıyeva R.C. İnformatika. Mühazirələr toplusu, QKU-nun Poliqr. və Nəşr. mərkəzi, Bakı, 2020,180 səh.
2. Широкова А. И., Пышняк М. Информатика. Разработка программ на языке программирования Питон, М., 2020, 144 с.
3. Əlizadə M.N., Orucova T.V., Həsənova N.Ə. İnformasiya təhlükəsizliyi. Bakı, "MSV Nəşr", 2018, 388 səh.
4. Информатика для экономистов. Учебник для бакалавриата и специалитета / ред. Поляков В. П. М.: Юрайт, 2019. 524 с.
5. Ляхович В.Ф., Молодцов В.А., Рыжикова Н.Б. Основы информатики. — М.: КноРус, 2016. — 348 с.
6. Макарова Н. В. Информатика: Учебник для вузов. Издательство: Питер, 2013, 576 с.
7. Информатика и информационные технологии / ред. Ю.Д. Романова. — М.: Эксмо, 2011. — 544 с.
8. Просветов Г.И. Анализ данных с помощью Excel. Задачи и решения. — М.: Альфа-Пресс, 2015. — 160 с
9. Набиуллина С.Н. Информатика и ИКТ. Курс лекций. М.: Лань, 2019. 72 с.
10. Гасумова С. Е. Социальная информатика. Учебник и практикум для вузов. М.: Юрайт, 2019. 284 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 Credit of the Course	**3**

Device 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 (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/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.	
Objectives of the Course: 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 areas of application	1, 2
3	Formation of ideas about information management	1, 2
4	Formation of ideas about database management systems 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 in the specialty	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		

Course's Contribution to 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	3
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3
6	ability to use various types of devices to monitor and control technological processes	3
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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	5
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	3
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		Lecture 1. Information Theory (Coding)	
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		Multimodal and natural human-computer interaction 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 Programme 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 Credit of the Course	**3**

Device 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 (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Rahimov Elkhan Rahim
Name of Lecturer (s)	Rahimov Elkhan Rahim
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.

Objectives of the Course:

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 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	2
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	2
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		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. Əfəndiyəv, M. (1998) Siyasi elmin problemləri. Bakı
2. Hüseynov, R. (2017) Politologiya. Bakı
3. Şirəliyev H., Əhmədov Ə. (1997) Politologiya. Bakı
4. Şiraliyev H. (1998) Politologiya. Bakı
5. Teymurlu, M. (2014) Politologiya. Bakı
6. Azərbaycan Dövlət İqtisad Universiteti (2004) Politologiya (Dərs vəsaiti). Bakı
7. Василик М. А. (ред.) (2001). Политология. Москва: Гардарики.
8. Пугачев В.П., Соловьев, А.И. (1998). Введение в политологию. Москва: Аспект Пресс.
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 Credit of the Course	**3**

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

Course Unit Title	Fundamentals of Enterpreneurship 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 (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	3
Semester when the course unit is delivered	7
Course Coordinator	Alberto Levy
Name of Lecturer (s)	Alberto Levy
Name of Assistant (s)	-
Mode of Delivery	Face to face

Language of Instruction	Azerbaijani, English
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 amidst the contextual reality of today's extreme uncertainty.

These skills will also be particularly relevant for future employment and businesses, as organisations 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.

Objectives of the Course:

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

Analyse the key components of the entrepreneurial process, namely; opportunity discovery, business modelling, 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 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	2
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	2

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	3
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		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 Prototype & 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, R.D., Peters, M.P., & Shepherd, D.A. Entrepreneurship (12th Edition). McGraw-Hill Education.
2. Scarborough, N.M. Essentials of Entrepreneurship and Small Business Management (9th Edition). Pearson.
3. Barringer, B.R. & Ireland, R.D. Entrepreneurship: Successfully Launching New Ventures (6th Edition). Pearson.
4. Boone, L. & Kurtz, D. Contemporary Business (18th Edition). Wiley.
5. Zimmerer, T.W. & Scarborough, N.M. 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 Credit of the Course	**3**

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	4
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	-
Year of Study	1
Semester when the course unit is delivered	1
Course Coordinator	Taghiyev Rauf Mursel
Name of Lecturer (s)	Taghiyev Rauf Mursel
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.

Objectives of the Course:
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 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	5
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	2
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	3
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	3
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	2
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		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. The concept of a matrix. Operations on matrices. Determinants of two and three orders. Basic properties of the determinant. Minor and algebraic complements	
3		Lecture 2. Inverse matrix. Elementary transformations on a matrix. Rank of a matrix. n-order determinants	
4		Seminar 2. Inverse matrix. Elementary transformations on a matrix. Rank of a matrix. n-order determinants	
5		Lecture 3. System of linear equations. Methods for solving a system of linear equations: Cramer's rules, matrix method	
6		Seminar 3. System of linear equations. Methods for solving a system of linear equations: Cramer's rules, matrix method	

7		Lecture 4. Gaussian method. System of linear equations in n-unknowns, Kronecker-Capelli theorem	
8		Seminar 4. Gaussian method. System of linear equations in n-unknowns, Kronecker-Capelli theorem	
9		Lecture 5. The concept of a vector. Scalar, vectorial and mixed products of vectors	
10		Seminar 5. The concept of a vector. Scalar, vectorial and mixed products of vectors	
11		Lecture 6. Equations of a straight line on a plane	
12		Seminar 6. Equations of a straight line on a plane	
13		Lecture 7. Equations of a plane and a straight line in space	
14		Seminar 7. Equations of a plane and a straight line in space	
15		Lecture 8. Second-order curves and surfaces Seminar 8. Second-order curves and surfaces	

Recommended Sources TEXTBOOK(S)

1. Howard Anton, Chris Rorres. Elementary linear algebra. 7-th edition, John Wiley& Sons, INC.
2. Демидович В.П., Кудрявцев В. А. Краткий курс высшей математики. М.: «Наука», 2001.
3. Ильин В. А., Куркина А. В. Высшая математика М.: 2005.
4. Ильин В. А., Позняк Э. Г. Линейная алгебра. М.: «Наука», 1981.
5. Беклемишев Д. В. Курс аналитической геометрии и линейной алгебры. М., «Высшая школа», 1998.
6. Alexander Akhmerov, Alexander Tyurin “Fundamental Higher Mathematics Linear Algebra and Analytical Geometry P.I” 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	**120**

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

Device 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	8
Theoretical (hour/week)	3
Practice (hour/week)	2
Laboratory (hour/week)	-
Year of Study	1
Semester when the course unit is delivered	2
Course Coordinator	Beshirov Shaban Heshim
Name of Lecturer (s)	Beshirov Shaban Heshim
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 "Calculus", the student should know and be able to do the following:

• know the basic methods of mathematical analysis and be able to apply them in practice;

• understand the computer to implement the technologies for solving various problems of mathematical analysis and be able to apply them in practice;

• have the skills to solve practical problems of mathematics;

It is intended to teach students the basic concepts of the subject, to 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.

Objectives of the Course:

The goal and main objective of teaching the subject is to provide future specialists with relevant knowledge about the subject of "Calculus" and to create in them the ability to effectively use this knowledge in their work. The knowledge acquired will be significantly needed by specialists in applying high technologies and improving them.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Be able to explain the basic concepts and methods used in mathematical analysis (limits, continuity, derivatives, integrals, etc.)	1, 2

2	Conduct analysis of limits and infinitely small/large functions	1, 2
3	Apply the concepts of the derivative and integral of a function to practical problems	1, 2
4	Conduct analytical analysis of sets, functions, and sequences	1, 2
5	Ability to construct and prove mathematical arguments	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	5
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	2
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
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	4
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	2
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		Lesson 1. Numerical sequence and its limit. Basic properties of the limit of a numerical sequence Lesson 2. Function and methods of its definition. Basic properties of functions. Limit of a function at a point and at infinity	

2		Lesson 3. Basic properties of the limit of a function. The existence theorem of the limit. Methods of calculating the limit of a function. Notable limits	
3		Lesson 4. Infinitesimal and infinitesimal functions. Equivalent infinitesimal functions and their main properties Lesson 5. Continuity of a function. Equivalent definitions of continuity of a function. Basic properties of a continuous function on a segment. Intersection points and types of intersection points	
4		Lesson 6. Derivative of a function. Geometric and mechanical meanings of the derivative of a function. Derivatives of basic elementary functions, methods for finding the derivative	
5		Lesson 7. Derivative of a parametric and implicitly given function. Derivatives of inverse and complex functions. Higher order derivative Lesson 8. Differential of a function, differentiation methods. Basic theorems of differential calculus: Rolle, Cauchy and Lagrange theorems	
6		Lesson 9. Application of differential calculus: Lopital's rule, Taylor's and Maclauren's formulas. Increasing and decreasing functions	
7		Lesson 10. Examining a function by extremum Lesson 11. Indefinite integrals. Basic properties of the indefinite integral. Basic integration methods. Table of indefinite integrals of elementary functions	
8		Lesson 12. Definite integral. Basic concepts. Basic properties of the definite integral	
9		Lesson 13. Basic methods of calculating the definite integral. Theorem about the average value Lesson 14. Application of the definite integral to solving a number of geometric problems	
10		Lesson 15. Methods for approximating a definite integral	
11		Lesson 16. Improper integrals. Types of improper integrals, accumulation and accumulation signs Lesson 17. Multivariable functions. Basic concepts. Limit and continuity of a bivariate function, particular derivatives of a bivariate function. Concept of complete differential	
12		Lesson 18. The derivative of a bivariate function with respect to direction. The concept of gradient	
13		Lesson 19. Extremum of a bivariate function. Necessary and sufficient conditions for an extremum Lesson 20. Numerical sequences. Basic concepts. Necessary and sufficient signs for numerical sequences to be cumulative. Sufficient signs for positive term series to be cumulative: comparison, D'Alembert and Cauchy signs	
14		Lesson 21. Sequences that alternately change sign. Leibniz sign. Absolute and conditional summation	
15		Lesson 22. Functional series. Power series. Radius of accumulation and region of accumulation of a power series Lesson 23. Decomposition of a series of elementary functions into Taylor and Maclaurin series	

Recommended Sources TEXTBOOK(S)

1. M. Mərdanov, S. İsayeva, R. Aslanov. Ali riyaziyyat, Bakı, 2020.
2. R. Məmmədov, "Ali riyaziyyat kursu", I hissə, Bakı, "Turan Evi" nəşriyyəti, 2013.
3. R. Məmmədov, "Ali riyaziyyat kursu", II hissə, Bakı, "Turan Evi" nəşriyyəti, 2016.
4. В.С. Шипачев. «Высшая математика», Из. Высшая школа, 2010.
5. В.А. Кудрявцев, Б.П. Демидович «Краткий курс высшей математики», М., Наука, 2001.
6. А.А. Гусак, Высшая математика: учебник для студентов вузов в 2-х томах, Минск, 2007, т.1
7. В.С. Шипачев. «Задачник по высшей математике», Изд. Высшая школа, 2010.
8. В.П. Минорский. «Сборник задач по высшей математике», М.: ФИЗМАТЛИТ, 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	**240**
Total Workload/30(h)	**240/30**
ECTS Credit of the Course	**8**

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

Course Unit Title	Applied Mathematics
Course Unit Code	İF-BO3
Type of Course Unit	Compulsory

Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hour/week)	2
Practice (hour/week)	1
Laboratory (hour/week)	-
Year of Study	2
Semester when the course unit is delivered	3
Course Coordinator	Beshirov Shaban Heshim
Name of Lecturer (s)	Beshirov Shaban Heshim
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
Applied mathematics is a subject that focuses on the application of various branches of mathematics (e.g., statistics, probability, analysis, algebra, etc.) to practical problems. This subject teaches students how to apply various tools of mathematics to real-world problems. Applied mathematics problems are used in engineering, economics, natural sciences, and many other fields.

Objectives of the Course:
To introduce students to the application areas of mathematics.
To teach the construction and solution of mathematical models.
To prepare them to solve real-life problems with mathematical tools.
To understand the integration of mathematics with other fields and to apply it in these fields.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	They have the ability to build mathematical models and apply these models to real-world problems	1, 2
2	They can use mathematical tools to solve problems in statistics, probability theory, optimization, and other applied fields	1, 2
3	They are able to solve mathematical problems using computer programs and other applied tools	1, 2
4	They develop analytical thinking and problem-solving skills related to various applications of mathematics	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3
6	ability to use various types of devices to monitor and control technological processes	3
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	4
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Lecture 1. Elements of error theory. Absolute and relative error and their properties	
2		Seminar 1. Elements of error theory. Absolute and relative error and their properties	
3		Lecture 2. Calculating the numerical value of a polynomial using the Horner scheme. Separating the roots of an equation	
4		Seminar 2. Calculating the numerical value of a polynomial using the Horner scheme. Separating the roots of an equation	
5		Lecture 3. Solving nonlinear equations using simple iteration method	
6		Seminar 3. Solving nonlinear equations using simple iteration method	
7		Lecture 4. Approximate solution of a system of linear equations using Cramer's rule	

8		Seminar 4. Approximate solution of a system of linear equations using Cramer's rule	
9		Lecture 5. Approximate solution of a system of linear equations using Gauss's method	
10		Seminar 5. Approximate solution of a system of linear equations using Gauss's method	
11		Lecture 6. Solving a system of linear equations using Seidel's method	
12		Seminar 6. Solving a system of linear equations using Seidel's method	
13		Lecture 7. Approximation of a definite integral. Method of rectangles. Method of trapezoids. Simpson's method	
14		Seminar 7. Approximation of a definite integral. Method of rectangles. Method of trapezoids. Simpson's method	
15		Newton's 1st and 2nd interpolation formulas Seminar 8. Newton's 1st and 2nd interpolation formulas	

Recommended Sources TEXTBOOK(S)

1. Н.В. Бурмашева, Е.Ю. Просвиряков, С.А. Берестова, Инженерная математика, Учебная пособие, Екатеринбург, 2022
2. Н.И. Коршунова Прикладная математика для экономистов Учебное пособие для бакалавриата, МОСКВА, 2021
3. Е.В. Новак, Т.В. Рязанова, И.В. Новак, Высшая Математика Алгебра Екатеринбург Издательство Уральского университета 2015
4. ALİ RİYAZİYYAT I hissə (Dərs vəsaiti), Bakı – 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 Credit of the Course	**4**

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

Course Unit Title	Fundamentals of Physics
Course Unit Code	İF-BO4
Type of Course Unit	Compulsory
Level of Course Unit	1st year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	1.33
Laboratory (hour/week)	0.66
Year of Study	1
Semester when the course unit is delivered	2
Course Coordinator	Selimov İlham Nasir
Name of Lecturer (s)	Selimov İlham Nasir
Name of Assistant (s)	-
Mode of Delivery	Face to face, laboratory
Language of Instruction	Azerbaijani, English
Prerequisites	**-**
Recommended Optional Program Components	**-**
Course description: The subject "Fundamentals of Physics" provides an explanation of natural phenomena with physical laws and the study of basic physical principles. The subject covers the basic concepts and laws of various fields of physics - mechanics, molecular physics, thermodynamics, electromagnetic phenomena, optics and atomic physics. This subject creates a basis for students to master future specialized subjects and forms the skills of mathematical and physical modeling in technical fields.	

Objectives of the Course:

1. To teach students the basic laws and principles of physics.
2. To develop the ability to construct and analyze mathematical models of natural processes.
3. To explain and apply the physical foundations of practical problems in engineering and technical fields.
4. To introduce experimental methods and provide a physical explanation of observed phenomena.
5. To train qualified personnel who can apply the acquired knowledge in scientific and technical fields.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Can explain the basic concepts and laws of physics	1, 2
2	Can understand the interrelationships between space, time, matter and energy	1, 2
3	Can analyze the basics of mechanical, thermal, electromagnetic and optical processes using mathematical and graphical methods	1, 2
4	Can model physical phenomena and processes and solve simple engineering problems	1, 2
5	Can make measurements using experimental devices and methods and analyze the results	1, 2
6	Have the ability to prepare scientific reports and presentations	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	5
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	5
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	2
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3
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	3
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	2

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		Lesson 1. Vectors and operations on them. Vectorial 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	
2		Lesson 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 1. Vectors and operations on them. Vectorial 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. Curvilinear motion along a circle, characterizing quantities - acceleration, angular and linear velocity. Dynamics. Inertial calculation systems. Newton's I and II laws. Weight of an object, gravitational force. Newton's -III law. Elastic forces. Friction force, types, coefficient of friction. Gravity. Law of universal gravitation. Mechanical work. Force, units of measurement. Impulse. Energy. Kinetic and potential energy	
3		Lesson 3. Elastic forces. Hooke's law. Mechanical stress. Friction force, types, friction coefficient. Gravitational force. Law of universal gravitation. Gravitational constant Mechanical work. Force, units of measurement. Impulse. Energy. Kinetic and potential energy. Law of conservation of mechanical energy. Law of conservation of momentum	
4		Lesson 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 2. Molecular kinetic concept. Molecular kinetic theory. Ideal gases. Isoprocesses. Equation of state of an ideal gas, graphs. Real gases. Force of interaction of molecules, Van der Waals equation. Dance movement. Mathematical and spring dancers. Period of dance. Harmonic dances. Equations of harmonic dance. Mechanical waves and their types. Wavelength	
5		Lesson 5. 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		Lesson 6. Electrostatics. Electric charge, their mutual force. Coulomb's law. Electric field intensity. Intensity vector flux. Relationship between electric field intensity and potential. Potential difference Laboratory 1. Introduction to laboratory work. Understanding of errors and information on safety techniques	
7		Lesson 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	
8		Lesson 8. Steady electric current. Conditions for the formation 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 Seminar 3. Electrostatics. Electric charge, their mutual force. Coulomb's law. Electric field intensity. Dielectrics. Dielectrics in an electric field. Polarization of dielectrics. Electric capacity, units. Capacitors Constant electric current. Formation of current Ohm's law for the circuit part. Resistance of wires. Specific resistance. Series and parallel connection of wires. Coulomb-Lens law	
9		Lesson 9. Structure and properties of solids. Crystals, ideal crystal structure. Classification of crystals according to their properties. Real crystals. Defects in crystals. Magnetic properties of substances. Paramagnets, diamagnets and ferromagnets. Magnetization vector. Molecular currents. Magnetic field intensity and its circulation	
10		Lesson 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 Laboratory 2. Determining the acceleration of gravity using mathematical equations	
11		Lesson 11. 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		Lesson 12. Motion of charged particles in a magnetic field. Lorentz force. Magnetic flux. Electromagnetic induction. Induction current. Self-induction, inductance. Lenz's rule Seminar 4. Electric current in liquids. Electric current in gases. Electric current in semiconductors. Types of electrical conductivity of	
		semiconductors, specific and additive conductivity. Magnetic field and its characteristics Ampere's law. Lorentz force Magnetic flux. Electromagnetic induction phenomenon. Self-induction phenomenon, inductance. Lenz's rule	
13		Lesson 13. Alternating current. Ohm's law for alternating current circuits. Transformers, principle of operation. Distribution and transmission of electrical energy over long distances	

14		Lesson 14. Elements of geometric optics. Thin lens, Linzal's formula. Optical power of a lens Diopter. Linear magnification of a lens. Wave properties of light. Interference of light. Coherence. Diffraction of light. Diffraction grating Laboratory 3. Coulomb potential and Coulomb field of metal surfaces, determination of the charge of a sphere. Calculation of the interaction force between charged particles	
15		Lesson 15. Structure of the atom. Thomson model of the atom. Rutherford experiment. Planetary model of the atom. Bohr theory. Bohr postulates, its shortcomings. Stationary states Seminar 5. Elements of geometric optics. Thin lens, Lens formula. Optical power of a lens Diopter. Linear magnification of a lens. Structure of the atom. Thomson model of the atom. Rutherford experiment. Planetary model of the atom. Bohr theory. Bohr postulates, its shortcomings. Stationary states	

Recommended Sources TEXTBOOK(S)

1. Qocayev Niftalı Mehralı oğlu. Ümumi fizika kursu. IV cild (optika). [ali məktəblər üçün dərslik]. Rəyçilər. F.r.e.d., prof., Mirzəli Murquzov, prof., Bəhram Əsgərov, Prof. Eldar Məsimov. Azərb. Resp. Təhsil Nazirliyi, Bakı Dövlət Universiteti.- Bakı: Bakı Universiteti, 2011.540 s.
2. Əliyev Bayram Zeynal oğlu. Ümumi fizika kursu. Rəyçilər. F.r.e.d., prof., S.A. Hacıyev, f.r.e.n., dos., Q.İ. Qəribibov. Ali məktəblət üçün dərs vəsaiti. Bakı, Elm, 2010, 294 s.
3. JearlWorker. Fundamentals of physics. Halliday/Resnick. 8th edition. 2007
4. Əhmədov Faiq Abduləvvəl oğlu. Ümumi fizika kursu. Rəyçilər. F.r.e.d., prof., A.H. Kazımzadə, f.r.e.d., prof., N.M. Mehdiyev. Ali məktəblət üçün dərs vəsaiti. Bakı, 2006, 348 s.
5. B.D. Əliyev, Q.T.Həsənov. Ümumi fizika kursu. Rəyçilər. F.r.e.d., prof., E.M. Qocayev, f.r.e.d., prof., N.M. Mehdiyev. Ali məktəblət üçün dərs vəsaiti. Bakı, 2004, 660 s.
6. İ.N. Səlimov, Fizika məsələlərinin kompüterlə həlli metodikası, 2018-ci il, 182 səh.
7. *Physics for Scientists and Engineers* by Knight (2nd Edition), Pearson – Addison Wesley (2008)
8. *Sears and Zemansky's University Physics* by Young and Freedman (12th Edition), Pearson – Addison Wesley (2008)
9. *Physics for Scientists & Engineers* by Giancoli (4th Edition), Pearson – Prentice Hall (2009)
10. *Physics for Scientists and Engineers* by Jewett and Serway (8th Edition), Brooks / Cole Cengage Learning (2010)
11. *University Physics* by Bauer and Westfall, McGraw – Hill (2011)
12. Qocayev E.M.,Səfərov N.Y. "Tətbiqi fizika"Bakı "AzTU "2018, 393 s.

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 Credit of the Course	**5**

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

Course Unit Title	Applied Physics
Course Unit Code	İF-BO5
Type of Course Unit	Compulsory
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	7
Theoretical (hour/week)	3
Practice (hour/week)	2
Laboratory (hour/week)	1
Year of Study	2
Semester when the course unit is delivered	4
Course Coordinator	Selimov İlham Nasir
Name of Lecturer (s)	Selimov İlham Nasir
Name of Assistant (s)	-

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

Course description:
To form relevant knowledge, skills and habits in students, to ensure that they conduct physical experiments, analyze the results and analyze the data obtained.

Objectives of the Course:
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 relevance of applied 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 lectures on the subject is that real and computer-based physical experiments should be conducted, educational films, and model computer programs should be used	1, 2
2	Important sections of the course program can be taken out for seminar classes. As a rule, theoretical materials requiring complex mathematical apparatus and various methods of solving problems are considered in seminars	1, 2
3	Students Students can receive various types of homework to consolidate the materials received in seminars. They will practically comprehend the subject by performing laboratory work.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	5
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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	4
6	ability to use various types of devices to monitor and control technological processes	3

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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Lesson 1. Acoustics. Sound waves, types. Ultrasound and its applications. Ultrasound in medicine. Doppler effect and its applications Lesson 2. Dielectrics. Magnetoelectrics. Free and bound charges. Field intensity in dielectrics. Polarization vector. Fields of application of dielectrics. Understanding of the zone theory of solids. Metals and dielectrics according to the zone theory	
2		Lesson 3. Electric current in gases. Non-independent and independent discharges – types. Plasma Electric current in vacuum. Thermoelectric phenomena. Emission of electrons from solids. Thermoelectron emission. Total output work. Electron and ion lamps. Electrovacuum diode. Electrovacuum triode	
3		Lesson 4. Electric current in semiconductors. Specific and additive conductivity of semiconductors. Contact phenomena in metals. Phenomena occurring in metals and semiconductors and their applications. Metal-semiconductor contact. Semiconductor devices Lesson 5. Rectifier, high frequency diodes. Thyristors. Bipolar and unipolar transistors. Drift transistor. Thyristors Bipolar and unipolar transistors. Drift transistor. Tensoelectric devices. Magnetic field recorders Thermistor	
4		Lesson 6. Classical electron theory of the conductivity of metals. Explanation of Ohm's, Coulomb-Lens and Wiedemann-France laws according to electron theory. Deficiencies of classical electron theory. Electric current in gases, independent and non-independent gas discharges. Concept of plasma. Thermoelectron emission, Langmuir's law	
5		Lesson 7. Magnetic properties of substances. Paramagnets, diamagnets and ferromagnets. Magnetization vector. Molecular currents. Magnetic field intensity and its circulation. Magnetic moment of atoms and molecules. Electromagnets Lesson 8. Electric current in liquids. Faraday's laws. Areas of application of electrolysis. Electrochemistry. Galvanotechnics	

6		Lesson 9. Electromagnetic oscillations and waves. Electromagnetic waves. Electrical oscillation contour. Free and damped electromagnetic oscillations. Forced electromagnetic oscillations. Resonance. Ohm's law for alternating current circuits. Transformers	
7		Lesson 10. Properties of electromagnetic waves, propagation speed in the medium. Plane electromagnetic waves. Energy of electromagnetic waves and energy flux density. Poynting vector open oscillation contour. Radiation, propagation and reception of electromagnetic waves. Dipole radiation. Electromagnetic wave scale and characteristics of its individual parts Lesson 11. Optics: Geometric optics and wave optics. Elements and concepts of geometric optics. Telescope, microscope - resolving powers. The eye as an optical system, nearsightedness and farsightedness. Magnifier and microscope	
8		Lesson 12. Interference. Young's experiment. Fresnel mirrors and prisms. Coherence. Intensity distribution during interference. Intensity in the case of incoherent sources. Interference in thin layers. Huygens-Fresnel principle. Diffraction from a single slit. Diffraction from multiple slits. Diffraction grating	
9		Lesson 13. Resolution of optical devices. Spectroscopy. X-rays and their diffraction. Dispersion of light. Spectra. Spectral instruments. Spectral analysis. Types of spectra. Light absorption. Light scattering Lesson 14. Elements of nonlinear optics, luminescence. Luminescence phenomenon. Types of luminescence. Laws of luminescence. Recording of luminescent radiation. Types of luminescent radiation	
10		Lesson 15. Thermal radiation. Laws of thermal radiation. Planck's formula for thermal radiation. Heat receivers. Pyrometers. Radiation pyrometers. Partial radiation pyrometers. Thermal vision. Balometer	
11		Lesson 16. Quantum optics. Optical holography. Elements of quantum optics. Planck's formula. Energy quantization. Light pressure. Compton effect. Bragg's formula. X-ray photography. Polarization of light. Natural and polarized light. Polarization in reflection and refraction. Artificial anisotropy. Kerr effect Lesson 17. Photoelectric effect and its laws. Einstein's theory of the photoelectric effect. Red limit and types of the photoelectric effect. Photons, energy, momentum, mass of photons. Photons. Photoelements, types	
12		Lesson 18. Elements of Solid State Physics and Quantum Statistics Concept of Quantum Statistics. Bose-Einstein and Fermi-Dirac Distribution Functions. Concept of Quantum Theory of Electrical Conductivity of Metals. Superconductivity	
13		Lesson 19. Optical quantum generator – lasers. History and development of lasers. New principle of amplification of electromagnetic radiation. Classification and structure of lasers. Main technical characteristics of lasers Lesson 20. Applications of lasers. The use of laser radiation in science, technology, production, military affairs and medicine	

14		Lesson 21. Elements of nuclear physics. Structure of the nucleus. Binding energy of the nucleus. Radiation. Nuclear reactions. Nuclear fission. Law of radioactive decay. Dosimetry. Chain reaction. Reactors. Controlled thermonuclear reactions	
15		Lesson 22. The emergence and development of nanotechnology, nanoparticles, nanostructures. Nanoparticles. nanostructures and nanoobjects. Microscopes used in nanotechnology. Probe microscopes. Microscopic research methods. Atomic force microscope	

Recommended Sources TEXTBOOK(S)

1. Abdinov Ə.Ş,Mehdiyev.N.M " Optoelektronika" Bakı " Maarif " 2005, 410 s
2. Qocayev E.M.,Səfərov N.Y. "Tətbiqi fizika"Bakı "AzTU "2018, 393 s
3. Həsənov İ.S " Plazma və dəstə texnologiyası" Bakı "Elm" 2007 ,171s.
4. Zərbəliyev M.M. "Yarımkeçiricilər fizikası" Bakı " Təhsil " 2008,455s.
4. Ə.Ş.Abdinov,İ.S.Həsənov,T.X.Hüseynov " Elektron cihazları və emissiya elektronikasının əsasları" Bakı 2011,358 s.
5. Q.T.Həsənov,Ə.Ə.Əliyev " Ümumi fizika kursu " Bakı 2015
6. Narayan Manohar Narkhede, Vijay Shivaji Baviskar, Milindkumar Suresh Sonawane "Applied Physics" Publisher: LAP LAMBERT Academic Publishing2018. 100 pages
7. Karl F. Kuhn, Frank Noschese. "Basic Physics: A Self-Teaching Guide", 3rd Edition Publisher: Wiley 2020. 352 Pages
8. Michael M. Mansfield, Colm O'Sullivan, "Understanding Physics", 3rd Edition Publisher: Wiley 2020. 656 Pages
9. Giulio Mazzi, Paolo Ronchese, Pierluigi Zotto "Physics in Laboratory. Experiments for Engineering Physics Courses" Publisher: Società Editrice Esculapio 2022. 144 pages
10. Kip S. Thorne, Roger D. Blandford "Statistical Physics" Volume 1 of Modern Classical Physics Publisher: Princeton University Press 2021. 384 pages
11. R.M.Rzayev.Fnzika,[ali məktəblər üçün dərslik]. Bakı 2015.736 s.
12. İ.N. Səlimov, Fizika məsələlərinin kompüterlə həlli metodikası, 2018-ci il, 182 səh.

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 Credit of the Course	**7**

Device Engineering bachelor program, Department of "Natural Sciences"

Course Unit Title	Chemistry
Course Unit Code	İF-B05
Type of Course Unit	Compulsory
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	2
Practice (hour/week)	1.33
Laboratory (hour/week)	0.66
Year of Study	2
Semester when the course unit is delivered	4
Course Coordinator	Selimov İlham Nasir
Name of Lecturer (s)	Selimov İlham Nasir
Name of Assistant (s)	-
Mode of Delivery	Face to face, laboratory
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-
Course description: To form relevant knowledge, skills and habits in students, to ensure that they conduct physical experiments, analyze the results and analyze the data obtained.	

Objectives of the Course:
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 relevance of applied 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. They will practically comprehend the subject by performing laboratory work	1, 2
2	The important aspect of lectures on the subject is that physical experiments should be conducted on real and computer, educational films, model computer programs should be used	1, 2
3	Important sections of the course program can be taken out for seminar classes	1, 2
4	As a rule, theoretical materials requiring complex mathematical apparatus, various methods of solving problems are considered in seminars	1, 2
5	Students can receive various types of homework to consolidate the materials received in seminars	1, 2
6	They will practically comprehend the subject by performing laboratory work	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	5
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	2
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	2
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	3
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	2

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		Introduction. Basic concepts of chemistry. Stoichiometric laws Seminar 1	
2		Models of atomic structure. Periodic law and periodic table of elements Seminar 2	
3		Characteristics of chemical bonds. Complex compounds Laboratory 1	
4		Energetics of chemical processes. Chemical kinetics Seminar 3	
5		Solutions. Electrolyte solutions Laboratory 2	
6		Oxidation-reduction reactions Seminar 4	
7		Chemistry of metals Laboratory 3	
8		Chemistry of metals. Continued Seminar 5	
9		Chemistry of Nonmetals Laboratory 4	
10		Chemistry of non-metals. Continued Seminar 6	
11		Hydrocarbons Seminar 7	
12		Hydrocarbon derivatives Seminar 8	
13		Organic polymer materials Laboratory 5	
14		Elements of chemical analysis Seminar 9	
15		Chemistry and ecology Seminar 10	

Recommended Sources TEXTBOOK(S)

1. Ə.A. Əlbəndov. Ümumi kimya: Ali məktəblər üçün dərsliklər seriyasından. Bakı, «Elm», 2011; 616 səh
2. Ə.B. Əliyev, Y.H. Həsənov, S.İ. Sadıxzadə. Ümumi və qeyri-üzvi kimya, “Maarif” Nəşriyyatı, Bakı, 1987
3. İ.O. Nəsibov, T.İ. Sultanov. Ümumi kimya, “Adiloğlu” Nəşriyyatı, 2002
4. A. Quliyev. Qeyri-üzvi kimyanın nəzəri əsasları, Bakı, 2003

5. V.M. Abbasov və başq. «Ümumi kimyanın əsasları». Bakı, 2000 6. B.V. Əliyev və başq. «Ümumi və qeyri-üzvi kimya». Bakı, 2010 7. Z.Ş. Qarayev «Qeyri-üzvi kimya». Bakı, 2013 8. I.U. Lətifov və başq. «Kimya». Bakı, 2003 9. Şavarov Ю.S. Orqaniceskaya ximiya. Moskva, Izdatelstva ximiya, 2002. 10. Petrov A.A., Trofimov A.T. Orqaniceskaya ximiya. Sankt - Peterburq, 2002.

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 Credit of the Course	**6**

Device Engineering bachelor program, Department of "Information Technology"

Course Unit Title	Fundamentals of Computer Systems Hardware and Software
Course Unit Code	İF-BO7
Type of Course Unit	Compulsory
Level of Course Unit	1st year

National Credits	
Number of ECTS Credits Allocated	7
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/week)	-
Year of Study	1
Semester when the course unit is delivered	1
Course Coordinator	Rahimova Gulnar Elchin
Name of Lecturer (s)	Rahimova Gulnar Elchin
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 Systems Hardware and Software" is the principle of organizing reconstruction in many areas of production processes, the stage of development of modern technology.

Objectives of the Course:
The purpose of the subject " Fundamentals of Computer Systems Hardware and Software" is that software consists of a set of programs necessary for processing primary information according to design algorithms, controlling the computing process, organizing the protection of primary and intermediate data, etc. operations and procedures.

Learning Outcomes

At the end of the course the student will be able to		**Assessment**
1	increase in labor productivity	1, 2
2	reduce production costs	1, 2
3	improve product quality	1, 2
4	increase in production process flexibility	1, 2
5	simple and flexible programming	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	3

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	5
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	5
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3
6	ability to use various types of devices to monitor and control technological processes	4
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	4
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	5
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	3
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		Computer and information technologies Seminar 1	
2		Classification of computers by generation Seminar 2	
3		Von Neumann Architecture Seminar 3	
4		Computer, structural diagram of HS Seminar 4	
5		Computer system unit and microprocessors Seminar 5	
6		Computer output devices. Liquid crystal, LED, plaza and other technology monitors Seminar 6	
7		Internal storage devices Seminar 7	
8		Organization and working principle of computers. Seminar 8	

9		Computer Software Seminar 9	
10		Computer Fundamentals Seminar 10	
11		Special software Seminar 11	
12		Application software package Seminar 12	
13		General Software Seminar 13	
14		Operating Systems Seminar 14	
15		Functions of an operating system Seminar 15	

Recommended Sources TEXTBOOK(S)

1. Kərimov S.Q., Həbibullayev S.B., İbrahimzadə T.İ. İnforamtika. Ali məktəblər üçün dərslik.Bakı, 2009.
2. Ə.M. Abbasov, R.A. Quliyev, Ə.K. Kərimov, M.H. Azadova. MS Access. Dərs vəsaiti, Bakı, 2021.
3. Abbasov Ə., Əlizadə M., Seyidzadə E., Salmanova M. İnformatika və kompüterləşmənin əsasları. Bakı, «Elm», 2020.
4. Информатика. Базовый курс: Учебник вузов / Под ред. С.В. Симоновича. СПб.: Питер, 2002.
5. Xəlilov M. İnformatika. Bakı, 2009.
6. İbrahim-zadə T., Sərdarov Y. Kompüter şəbəkələrinin əsasları və proqram təminatı. Bakı, 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	**210**
Total Workload/30(h)	**210/30**

ECTS Credit of the Course	**7**

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

Course Unit Title	Engineering Graphics and Design
Course Unit Code	İF-B08
Type of Course Unit	Compulsory
Level of Course Unit	1st year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	-
Year of Study	1
Semester when the course unit is delivered	2
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: This subject, which plays an important role in the training of highly qualified technical personnel, deals with the study of the theoretical and practical foundations of the preparation of technical drawings that can meet the requirements of the state standard (GOST) - Unified System of Design Documents (USDD) and the International Organization for Standardization (ISO).	
Objectives of the Course: The main goal of teaching the subject is to instill in future device engineers the ability to work with construction documents while designing technological processes, adhering to methods of ensuring accuracy and quality, to give the described object the shape and size in accordance with the requirements, to determine the position of the object in space, and to work with traditional and electronic technical equipment. At the same time, the goal of the subject is for specialists to effectively use the knowledge they have acquired during the course and continue their future work activities.	

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 specialists, and to educate a patriotic young generation.	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		
Course's Contribution to 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	3
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	2
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	5
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	3
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	3
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	2
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		Lecture 1. Introduction. Standards for drawing. Rules and standards used for drawing	
2		Seminar 1. Introduction. Standards for drawing. Rules and standards used for drawing	

3		Lecture 2. Types of projection. Projection planes	
4		Seminar 2. Types of projection. Projection planes	
5		Lecture 3. Orthogonal projections of a point, a straight line and a plane. Projection planes of a point, representation in spatial squares	
6		Seminar 3. Orthogonal projections of a point, a straight line and a plane. Projection planes of a point, representation in spatial squares	
7		Lecture 4. The position of a straight line with respect to the projection planes. Complex graph of a straight line. The position of a point on a straight line. Traces of a straight line; true length. The position of two straight lines with respect to each other	
8		Seminar 4. The position of a straight line with respect to the projection planes. Complex graph of a straight line. The position of a point on a straight line. Traces of a straight line; true length. The position of two straight lines with respect to each other	
9		Lecture 5. Description of a plane in a drawing. Plane states. Main lines of a plane	
10		Seminar 5. Description of a plane in a drawing. Plane states. Main lines of a plane	
11		Lecture 6. Polyhedra. Axonometric projections. Construction of axonometric projections	
12		Seminar 6. Polyhedra. Axonometric projections. Construction of axonometric projections	
13		Lecture 7. Detachable joints. Non-detachable detail joints	
14		Seminar 7. Detachable joints. Non-detachable detail joints	
15		Object description. AutoCAD program, basic information, program interface Seminar 8. Object description. AutoCAD program, basic information, program interface	

Recommended Sources TEXTBOOK(S)

1. İmanov Ə.S. Tərsimi həndəsə və mühəndis qrafikası" Bakı. 2018, 156 s.
2. M.A. Məmmədova «Tərsimi həndəsə və mühəndis qrafikası». Ali texniki məktəblər üçün dərslik. Bakı: ADNSU-nun mətbəəsi, 2019. 174 səhifə
3. Mustafayev M. R., İmanov Ə.S., Eyyubov R.H. Kompüter qrafikası, AutoCAD-2013, MAA-ın poliqrafiya mərkəzi, 351s, 2012-ci il.
4. İmanov Ə.S., Qələndərov Z.S., Məmmədov N.M. Tərsimi həndəsə və mühəndis qrafikası" Bakı. 2016.
5. S.H. Mirzəyev, Ə.S. İmanov, M.Ə. Məmmədova Mühəndis qrafikası Az TU, 2014

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 Credit of the Course		**4**

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

Course Unit Title	Electrical Engineering
Course Unit Code	İF-BO9
Type of Course Unit	Compulsory
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	7
Theoretical (hour/week)	3
Practice (hour/week)	3
Laboratory (hour/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 of "Electrical Engineering" of the production department provides basic information about the basic laws of electrical engineering, methods of analysis of electrical circuits, basic concepts of electric and magnetic circuits, operating principles of devices, properties, parameters and their characteristics. Considering all this, it is clear that studying electrical engineering is important.

Objectives of the Course:
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	1, 2
2	Electrical measuring devices	1, 2
3	Basic laws of electrical circuits	1, 2
4	Ideal electrical circuit with R, L and C elements	1, 2
5	Structure and working principle of transformers	1, 2
6	DC machines	1, 2
7	Asynchronous machines	1, 2
8	Synchronous machines	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	5
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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	5
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3
6	ability to use various types of devices to monitor and control technological processes	5

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	4
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Lesson 1. Historical development of electrical engineering. Basic concepts of electrical engineering science Lesson 2. Basic concepts of electric and magnetic circuits	
2		Lesson 3. Basic quantities characterizing electromagnetic processes in electrical circuits	
3		Lesson 4. Power sources. Electrical measuring devices Lesson 5. Analysis and reporting methods of linear and nonlinear circuits of electrical circuits	
4		Lesson 6. Basic laws of electrical circuits. Ohm's law for a circuit part and a complete circuit. Power balance. Kirchhoff's laws	
5		Lesson 7. Operating modes of electrical circuits. Combination forms of resistances and their reporting forms Lesson 8. Ideal electrical circuit with R, L and C elements	
6		Lesson 9. Voltage resonance. Power triangle	
7		Lesson 10. Single-phase alternating current circuits Lesson 11. Three-phase alternating current circuits	
8		Lesson 12. Magnetic circuits. Basic laws of magnetic circuits	
9		Lesson 13. Transformers. Structure, operating principle of transformers Lesson 14. Types of transformers. Three-phase transformers	
10		Lesson 15. Autotransformers. Current measuring transformers. Voltage measuring transformers	
11		Lesson 16. General information about synchronous machines Lesson 17. Synchronous generators and tachogenerators, parallel operation of synchronous generators. Synchronous reactive motors	
12		Lesson 18. Structure and operating principle of asynchronous machines	
13		Lesson 19. Three-phase asynchronous motor. Starting and speed regulation of an asynchronous motor Lesson 20. Structure, operating principle and areas of application of direct current machines	

14		Lesson 21. Methods of influencing direct current machines. Reversing direct current motors. Collector. Anchor	
15		Lesson 22. Semiconductor electronic elements used in electrotechnical devices and products Lesson 23. Working principle of devices used in electrotechnical devices	

Recommended Sources TEXTBOOK(S)

1. Abdullayev N.D., İsmayılov K.Q., Əbdülqədirov A.İ. "Elektrik maşınlarının sınağı və etibarlılığı" Bakı-1990
2. Abdullayev Y.R. "Elektrik və elektron aparatları" Bakı, Hərbi nəşriyyat, 1999 (I hissə)
3. Abdullayev Y.R. "Elektrik və elektron aparatları" Bakı, Hərbi nəşriyyat, 1999 (II hissə)
4. Osmanov S.C., Qasımova T.Q. "Elektrik maşınları" (I hissə) Bakı-2007
5. Osmanov S.C., "Elektrik maşınları" (II hissə) Bakı-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	**210**
Total Workload/30(h)	**210/30**
ECTS Credit of the Course	**7**

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

Course Unit Title	Mechanical Engineering
Course Unit Code	İF-B10
Type of Course Unit	Compulsory
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/week)	-
Year of Study	3
Semester when the course unit is delivered	5
Course Coordinator	Hamidova Gulnar Abdulhamid
Name of Lecturer (s)	Hamidova Gulnar Abdulhamid
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	**-**

Course description:
The subject teaches materials on the peculiarities of machine production; the purpose, structure, and performance characteristics of technological processes; evaluation of output parameters of technological processes; principles of operation of technological equipment, the laws that operate between technological system elements, and the rules for using these laws in the management of technological processes.

Objectives of the Course:
The main goal of teaching the subject is to provide students with basic knowledge of the features of ensuring the quality of production of machines and their parts and the laws that affect their manufacturing processes, and to develop in them the skills to manage technological processes based on the theoretical knowledge they have acquired. The subject of "Machine Manufacturing Technology" plays a great role in the training of engineering personnel.

Learning Outcomes

At the end of the course the student will be able to		**Assessment**
1	Students' mastery of materials on the purpose, structure, and features of their implementation of technological processes in machine production	1, 2

2	Formation of general knowledge in students on the production of machines and their parts	1, 2
3	Familiarization with the laws of interaction between technological system elements and the structure of rules for using these laws in the management of technological processes	1, 2
4	Investigation of the constructions and production processes of machines and their parts and study of the characteristics of identifying and managing factors affecting the formed quality	1, 2
5	Evaluation of technological parameters, efficiency of various processes, study of the features of ensuring the reliability of the technological process	1, 2
6	Performance of practical tasks used in the field of machine production for students studying at the bachelor's level	1, 2
7	Control and investigation of the level of implementation of practical tasks	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	5
6	ability to use various types of devices to monitor and control technological processes	4
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	4
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Lecture 1. Introduction. Basic concepts. Fundamentals of machine parts design	
2		Lecture 2. Criteria for the performance of machine parts. Strength. Hardness. Wear resistance	
3		Lecture 3. Reliability of machine parts	
4		Lecture 4. Materials used in mechanical engineering	
5		Lecture 5. Technological requirements for machine parts	
6		Lecture 6. Threaded joint	
7		Lecture 7. Welded joint	
8		Lecture 8. Riveted joint	
9		Lecture 9. Shaft - groove type guaranteed - tension installation	
10		Lecture 10. Joint, slot and profile joints	
11		Lecture 11. Mechanical transmissions. Belt transmission	
12		Lecture 12. Worm screw transmission. Novikov transmission	
13		Lecture 13. Planetary gear transmission and reducers	
14		Lecture 14. Optimization of mechanical transmissions and calculation in ECM	
15		Lecture 15. Axles, shafts, bearings, couplings and springs	

Recommended Sources TEXTBOOK(S)

1. Rəsulov N.M. Maşın istehsalı texnologiyası. Dərslik, Bakı, Təhsil, NPM, 2010, 432 s
2. Kərimov Z.H. Maşın hissələri və yükqaldırıcı – nəqledici maşınlar. Ali texniki məktəblər üçün dərslik. II nəşri – Bakı, 2002, 596 səh.

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 Credit of the Course	**6**

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

Course Unit Title	Electronics and Circuit engineering
Course Unit Code	İF-B11
Type of Course Unit	Compulsory
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	3
Practice (hour/week)	2
Laboratory (hour/week)	-
Year of Study	3
Semester when the course unit is delivered	6
Course Coordinator	Rustəmova Durdana Farhad
Name of Lecturer (s)	Rustəmova 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 plays an indispensable role in the use of alternative energy sources, especially solar and wind energy. Considering all this, it is clear that it is important to study the basics of electronics and circuit engineering.

Objectives of the Course:
The purpose of teaching the subject "Electronics and Circuit Engineering" in higher education institutions is to:
Understand the working principle of electronic devices, primarily semiconductor devices;
Functional capabilities, structure and application areas of electronic devices;
Circuit engineering capabilities in the field of analog and discrete electronics;
Analysis of the main technical and operational characteristics of modern electronic devices;
Development directions of microelectronics;
Application schemes of microelectronic elements;
Must know and be able to apply in practice the methods of conducting reports of microelectronic elements.
At the end of the educational process, the student should be able to work independently in any direction and be able to continue his education throughout his life.

Learning Outcomes

At the end of the course the student will be able to		**Assessment**
1	Semiconductor devices and physical processes occurring in them	1, 2
2	Diodes and transistors, physical processes occurring in them and their areas of application	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 oscillators. LC – autogenerators, RC – autogenerators	1, 2
6	Pulse signal generators, triggers, multivibrators	1, 2
7	Digital electronic and microelectronic devices	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	4
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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	4

5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3
6	ability to use various types of devices to monitor and control technological processes	4
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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Lesson 1. General information about semiconductor materials. Special and additive conductors Lesson 2. Concentration of charge carriers 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 and heterojunctions Lesson 5. Classification of semiconductor diodes Seminar 3	
4		Lesson 6. Rectifier diodes and their schematics Seminar 4	
5		Lesson 7. Bipolar transistors. Bipolar transistor operating modes Lesson 8. Unipolar transistors Seminar 5	
6		Lesson 9. Thyristors Seminar 6	
7		Lesson 10. Optical and photoelectric properties of semiconductors Lesson 11. Technological foundations of microelectronics Seminar 7	
8		Lesson 12. Classification of integrated circuits Seminar 8	
9		Lesson 13. Amplifiers. Classification of amplifiers Lesson 14. Operational amplifiers. Linear circuits with operational amplifiers Seminar 9	

10		Lesson 15. Electronic switch circuits. Bipolar transistor switch circuit Seminar 10	
11		Lesson 16. Logic elements. Integrated circuits of bipolar transistor logic elements Lesson 17. Bipolar transistor logic elements Seminar 11	
12		Lesson 18. Triggers Seminar 12	
13		Lesson 19. Power sources of electronic devices Lesson 20. Single-phase rectifiers Seminar 13	
14		Lesson 20**.** General information about three-phase and multi-phase rectifiers Seminar 14	
15		Lesson 15. Smoothing filters Seminar 15	

Recommended Sources TEXTBOOK(S)

1. R.T. Humbətov. Elektronika. I hissə, Maarif nəşriyyatı, Bakı, 2002.
2. R.T. Humbətov. Elektronika. II hissə, Maarif nəşriyyatı, Bakı, 2010.
3. M.N. Yolçuyev, N.S. Axundov. Elektrotexnika və Elektronika. MBM nəşriyyatı, Bakı, 2012.
4. Musayev Z.N., Qasımova T.Q., "Elektrik maşınlarının layihələndirilməsi" Bakı-2004
5. Əbdülrəhmanov Q.A., "Elektrik və elektron aparatları" Bakı-2006, "Təhsil" NPM
6. Fransız Verlag İSBN 9783645270441 Electrical Engineering & Telecommunications, 2013
7. De Gruyter Lehrbuch der elektrotechnik İSBN 9783645270441, 2020

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 Credit of the Course	**6**

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

Course Unit Title	Computer-based device engineering
Course Unit Code	İF-B12
Type of Course Unit	Compulsory
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/week)	-
Year of Study	3
Semester when the course unit is delivered	5
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:
Computer-aided device engineering is a field that studies the application of computer technologies in the development of electronic and electro-mechanical systems. This subject provides students with knowledge about the design of various devices, their operating principles, and their integration with computer-aided control systems.

Objectives of the Course:
Among the general technical subjects taught in higher technical schools, the subject "Computer-based device engineering" taught in mechanical-profile directions has a special place. This subject, which plays an important role in the training of highly qualified technical personnel, deals with the study of the theoretical and practical foundations of the preparation of technical drawings that can meet the requirements of the state standard (GOST) - the Unified System of Design Documents (USDD) and the International Organization for Standardization (ISO).

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 specialists, and to educate a patriotic young generation.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation		
Course's Contribution to 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	3
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	5
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	5
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3
6	ability to use various types of devices to monitor and control technological processes	4
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	4
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	5
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	2
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		Lesson 1. Introduction. Standards for drawing. Rules used for drawing. Lines. Types of lines Seminar 1	
2		Lesson 2. Types of projection. Projection planes. Central projection method. Parallel projection method. Rectangular (orthogonal) projection method Lesson 3. Types of projection. Projection planes. Central projection method. Parallel projection method. Rectangular (orthogonal) projection method Seminar 2	

3		Lesson 4. Orthogonal projections of a point, straight line and plane. Projection planes of a point, representation in spatial squares Seminar 3	
4		Lesson 5. Position of a straight line relative to the projection planes. Complex drawing of a straight line. Position of a point on a straight line. Traces of a straight line. Determination of the true length of an arbitrary straight line segment. The position of two	
		straight lines relative to each other. Intersecting straight lines. Parallel straight lines. Crossed straight lines Lesson 6. The position of a straight line relative to the projection planes. Complex drawing of a straight line. The location of a point on a straight line. Traces of a straight line. Determination of the true length of an arbitrary straight line segment. The position of two straight lines relative to each other. Intersecting straight lines. Parallel straight lines. Crossed straight lines Seminar 4	
5		Lesson 7. The depiction of a plane in a drawing. The positions of a plane. The main lines of a plane Seminar 5	
6		Lesson 8. The depiction of a plane in a drawing. The positions of a plane. The main lines of a plane Lesson 9. The location of a point and a straight line on a plane. Straight lines parallel and perpendicular to a plane. Two parallel and perpendicular planes. Intersection of two planes Seminar 6	
7		Lesson 10. A point and a straight line on a plane. Straight lines parallel and perpendicular to a plane. Two parallel and perpendicular planes. Intersection of two planes Seminar 7	
8		Lesson 11. Intersection of polyhedra with a plane. Intersection of a polyhedra with a straight line. Opening of polyhedra Lessson 12. Intersection of polyhedra with a plane. Intersection of a polyhedra with a straight line. Opening of polyhedra Seminar 8	
9		Lesson 13. Axonometric projections. Construction of axonometric projections Seminar 9	
10		Lesson 14. Axonometric projections. Construction of axonometric projections Lesson 15. Construction of sections in axonometric projections. Seminar 10	
11		Lesson 16. Construction of sections in axonometric projections. Seminar 11	
12		Lesson 17. Dismountable joints. Non-dismountable joints of parts Seminar 12	
13		Lesson 18. Dismountable joints. Non-detachable detail joints Seminar 13	
14		Lesson 19. Other types of joints and graphic description of transmissions Seminar 14	

15		Lesson 20. Other types of joints and graphic description of transmissions Seminar 15	

Recommended Sources TEXTBOOK(S)

1. S.H. Mirzəyev, Ə.S.imanov "Mühəndis kompyüter qrafikası", Bakı 2014
2. Mustafayev M.R. İmanov Ə.S. "Tərsimi həndəsə və mühəndis qrafikası fənnindən fərdi işlərin yerinə yetirilməsi" Bakı 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	**150**
Total Workload/30(h)	**150/30**
ECTS Credit of the Course	**5**

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

Course Unit Title	Quality Control and Metrology
Course Unit Code	İF-B13
Type of Course Unit	Compulsory
Level of Course Unit	3rd year

National Credits	
Number of ECTS Credits Allocated	7
Theoretical (hour/week)	3
Practice (hour/week)	3
Laboratory (hour/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 course "Quality Control and Metrology" consists of theoretical lessons and laboratory exercises. The course reviews the main issues of metrology science, provides basic information about measurements, measuring instruments and their characteristics. It is clear that studying the course "Quality Control and Metrology" is important.

Objectives of the Course:
The course is considered a key tool in the training of students in the field of metrology, standardization and quality management, as well as in the design and operation of measuring instruments.
The knowledge acquired will not only provide these specialists with knowledge in the field of "Quality control and metrology", but will also be significantly needed in improving them.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	The essence and main characteristics of measurements	1, 2
2	Classification of measuring instruments	1, 2
3	Detection and elimination of systematic errors	1, 2
4	Reliability of measuring instruments	1, 2
5	Evaluation of the result and error of direct measurement carried out with numerous observations	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	3
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	5
6	ability to use various types of devices to monitor and control technological processes	5
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	5
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Lesson 1. Basic terms and concepts of metrology. Physical properties of quantities and scales Lesson 2. System of physical quantities and their units. International system of units	
2		Lesson 3. Reflection of physical quantity units and their dimensions	
3		Lesson 4. Units and standards of the system Lesson 5. Model of measurement and basic postulates of metrology	
4		Lesson 6. Errors of measurements	
5		Lesson 7. Quality of measurement Lesson 8. Methods of processing measurement results	
6		Lesson 9. Dynamic measurements and dynamic errors	

7		Lesson 10. Normalization of metrological characteristics of measuring instruments. Types of measuring instruments Lesson 11. Metrological characteristics of measuring instruments	
8		Lesson 12. Accuracy classes of measuring instruments	
9		Lesson 13. Models of normalization of metrological characteristics Lesson 14. Normalization of dynamic errors of measuring instruments	
10		Lesson 15. Metrological reliability of measuring instruments	
11		Lesson 16. Concepts of verification and control Lesson 17. Principles of metrological assurance. Fundamentals of metrological assurance	
12		Lesson 18. State Committee of the Republic of Azerbaijan on Standardization, Metrology and Patents	
13		Lesson 19. State metrological control and inspection Lesson 20. Metrological attestation of measuring instruments and testing equipment	
14		Lesson 21. Application of standards. State control over standards and sanctions for violation of their requirements	
15		Lesson 22. Certification system of measuring instruments. Essence and content of certification. Basic terms and concepts	
		Lesson 23. Metrological examination. Analysis of the state of measurement. Essence of mandatory and voluntary certification. National certification system AZS	

Recommended Sources

TEXTBOOK(S)

1. N.H. Fərzanə., H.C. Cəfərov, C.M. Abbasova. “Metrologiyanın əsasları”
2. Преображенский В.П. Теплотехнические измерения и приборы. М. Энергия 1978.
3. Рабинович С.Г. Погрешности измерений. –Л. Энергия. 11978
4. Фарзане Н.Г., Илясов Л.В., Азимзаде А.Ю. Технологические измерения и приборы. – М. Высшая школа, 1989.
5. Məmmədov N.R. Sertifikatlaşdırmanın əsasları, Dərs vəsaiti. – Bakı, Elm, 2001
6. AZS Milli sertifikatlaşdırma sistemi. Rəhbəredici sənədlərin məcmusu-1 hissə, Bakı: Azərdövlətstandart, 1993.

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 Credit of the Course	**7**

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

Course Unit Title	Measuring Technologies
Course Unit Code	İF-B14
Type of Course Unit	Compulsory
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/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 "Measurement Technologies" belongs to the block of general technical subjects. The subject "Measurement Technologies" is intended for all technical specialties of the modern era. Bachelors who are trained in technical directions in higher education institutions will be able to study in detail the issues of improving the quality and achieving the required accuracy during the design, production technology and operation of devices by mastering the subject "Measurement Technologies".

Objectives of the Course:
The main goal of teaching the subject is to instill in future specialists the relevant knowledge about "Measurement technologies" and to create the ability to effectively use the knowledge they have acquired during the course.
The knowledge acquired will significantly help these specialists in their future work activities

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	The main goal set in teaching the subject is to achieve a high level of achievement and to train highly knowledgeable, skilled specialists and patriotic personnel.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	3
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	5
6	ability to use various types of devices to monitor and control technological processes	5

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	5
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Lecture 1. Introduction to the subject, the role of measurement techniques, measuring devices and systems, development directions	
2		Lecture 2. Basic concepts and definitions of measurements. Main stages of measurement	
3		Lecture 3. Physical quantity. Unit of physical quantity	
4		Lecture 4. Amount of information. Entropy	
5		Lecture 5. Measurement information signals	
6		Lecture 6. Measuring instruments, Characteristics of measuring instruments	
7		Lecture 7. Types and methods of measurements	
8		Lecture 8. Measurement schemes	
9		Lecture 9. Bridge measurement schemes	
10		Lecture 10. Compensation measurement methods	
11		Lecture 11. Measuring devices	
12		Lecture 12. Magnetic materials	
13		Lecture 13. Information-measuring systems	
14		Lecture 14. Measurement systems	
15		Lecture 15. Virtual information, intellectual and telemetry measurement systems	

Recommended Sources TEXTBOOK(S)

1. H.Ə. Məmmədov, R.M. Əhmədov. Ölçmə texnikasının əsasları. Ali məktəblər üçün dərslik. Bakı, “Elm”, 2011, 292 səh.
2. Ölçmə texnologiyaları, Mühazirə toplusu, Ali məktəblər üçün dərs vəsaiti. Elnare Firdus 2023
3. Məmmədov H.Ə., Hacıyev Ç.M. Ölçmə nəticələrinin emal metodları -Bakı: Sabah, 2008.
4. Məmmədov H.Ə., Əhmədov R.M. İdarəetmə sistemlərinin element və qurğuları – Bakı: Elm, 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	**180**
Total Workload/30(h)	**180/30**
ECTS Credit of the Course	**6**

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

Course Unit Title	Industrial Devices
Course Unit Code	İF-B15
Type of Course Unit	Compulsory
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	3
Practice (hour/week)	2
Laboratory (hour/week)	
Year of Study	4

Semester when the course unit is delivered	7
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:
The Industrial Devices subject covers knowledge about the design, operating principles, technical characteristics, and control systems of devices used in various industrial fields. This subject provides students with fundamental and applied knowledge about the construction, operation, and maintenance of industrial equipment and automated systems.

Objectives of the Course:

- To teach the operating principle and technical characteristics of industrial devices.
- To provide knowledge about the design and operation of devices used in various industrial fields.
- To understand and apply control systems (PLC, SCADA, etc.) that are important for industrial automation.
- To explain the functions of sensors and actuators used in production.
- To impart the knowledge required to ensure the maintenance and safety of industrial equipment.
- To provide students with knowledge about the application of industrial robotics and IoT technologies

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Be able to explain the operating principles and technical characteristics of industrial devices	1, 2
2	Be able to analyze and apply automated industrial control systems	1, 2
3	Be able to understand and apply the role of sensors and actuators in industrial processes	1, 2
4	Explain the working mechanisms and application areas of hydraulic and pneumatic systems	1, 2
5	Analyze industrial robots and their application in production	1, 2
6	Apply maintenance and safety standards of industrial equipment	1, 2
7	Be able to explain the use and benefits of IoT and digital industrial technologies	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	3

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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	5
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	5
6	ability to use various types of devices to monitor and control technological processes	5
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	5
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Lesson 1. Introduction, main goals and objectives of the subject, relationship with other subjects. Characteristics of industrial devices Lesson 2. Modern industrial devices, classification, general concept. Their properties, structure, components, working principles	
2		Lesson 3. Effects resulting from mechanical and thermal effects. Piezoelectric effects. Pressure transducers. Methods of measuring pressure	
3		Lesson 4. Elements of theory. Spring pressure transducer. Volume method. Manometer method, electric distance manometer Lesson 5. Thermoresistive effects. Temperature measuring devices and temperature transducers. Thermoresistive method Metallic temperature transmitters. Thermomanometers	
4		Lesson 6. Types of thermoresistors, materials used and basic calculations. Seebeck effect	
5		Lesson 7. Semiconductor thermoresistors. Thermoelectric method. Methodological errors of temperature sensors Lesson 8. Galvanomagnetic and magnetoresistive devices. Hall effect. Devices based on Hall transducers	

6		Lesson 9. Methods of measuring angular displacement, angular velocity of shaft rotation. Devices for measuring the angular velocity of shaft rotation	
7		Lesson 10. Tachogenerators and electric tachometers measuring from a distance. The main faults of tachogenerators Lesson 11. Alternating current tachogenerators. Digital tachometer, its advantages and disadvantages, analysis of faults	
8		Lesson 12. Effects arising from the influence of light rays. Brief information about radiation converters. Photoresistors	
9		Lesson 13. Photoeffect, laws. Photocells. Photomeasuring devices Lesson 14. Thermal radiation. General concepts. Complete radiation pyrometers or radiation pyrometers. Incomplete radiation pyrometers	
10		Lesson 15. Radiation pyrometers with high-temperature parts. Thermal imaging devices and thermographs	
11		Lesson 16. Optical methods of measurement. Interferometers. Light beam sources. Optical detectors. Optical fibers, theory of formation Lesson 17. Methods of radiation measurement. Basic concepts of radioactive radiation	
12		Lesson 18. Sources of ionizing radiation, main dependencies when using rays - radioactive isotopes used when using rays	
13		Lesson 19. Gas discharge devices. Scintillation counters. Scintillation counters Lesson 20. Connection scheme of the ionizer, errors of devices based on use. Areas of application of ionization converters	
14		Lesson 21. Electrical measuring instruments. Electrical measuring methods. Types of electromechanical devices	
15		Lesson 22. Magnetic electric measuring mechanisms. Ferrodynamic measuring mechanisms. Magnetic electric ammeters. Electromagnetic voltmeters Lesson 23. Electrodynamic ammeters. Electrodynamic voltmeters. Electronic measuring devices. Electronic classification. Trigger Classification of digital measuring devices. Trigger	

Recommended Sources TEXTBOOK(S)

1. Nəbiyev R.N., Vəliyeva Q.C. Dozimetrik cihazlar və sistemlər. Bakı-2014, 164 səh.
2. V.İ. Nəsirov, E.V. Nəsirov, S.A. Səmədov, Elektrik dövrələrinin nəzəri əsasları. Bakı-2015.Dərs vəsaiti., 295 s.
3. Paşayev A.M., Hacıyev N.C., Nəbiyev R.N. Elektronikanın əsasları / Ali məktəblər üçün dərs vəsaiti. Bakı – 2002. 272 s
4. Əliyev Bayram Zeynal oğlu. Ümumi fizika kursu. Ali məktəblət üçün dərs vəsaiti. Bakı, Elm, 2010, 294 s.
5. B.D. Əliyev, Q.T.Həsənov. Ümumi fizika kursu. Ali məktəblət üçün dərs vəsaiti. Bakı, 2004, 660
6. Ocaqov H.O. Radiasiya və kimya kəşfiyyatı cihazları. Bakı, Azərnəşr, 1997
7. Məmmədov R.Q.,Abbasov V.A. İnformasiyanın alınmasının fiziki əsasları. Dərslik, 2014, 480s.

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 Credit of the Course	**6**

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

Course Unit Title	Materials Science
Course Unit Code	İF-B16
Type of Course Unit	Compulsory
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/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 "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.

Objectives of the Course:
The goal and main objective of teaching the subject "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	Classification of materials science	1, 2
2	The role of materials science in the development of technical systems	1, 2
3	Methods for measuring hardness	1, 2
4	Non-ferrous metals and their alloys	1, 2
5	Hard 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 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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	5
6	ability to use various types of devices to monitor and control technological processes	3

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

Recommended Sources TEXTBOOK(S)

1. F.D. Gelin, E.İ. Krupitski, İ.P. Poznyak. Materialşünaslıq. “Maarif” nəşriyyatı. Bakı, 1983.
2. Y.Q. Vonoqradov, S.S. Orlov, L.A. Popova. “Çilingər-santexniklər, çilingər-quraşdırıcılar, inşaatmaşınlarının maşinistləri üçün Materialşünaslıq. Maarif, 1983.
3. V.A. Dubrovksi “Materialşünaslığın əsasları”. Azərtədrisnəşr, Bakı 1963.
4. “Справочник по електротехническим материалом”. В. 3т.т. 2/нод ред. Ю.В.Коричкого и др. М. Энергоатомиздат 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	**180**
Total Workload/30(h)	**180/30**
ECTS Credit of the Course	**6**

Device Engineering bachelor program, Department of “Mechanics and Mathematics”

Course Unit Title	Microprocessors and Microcontrollers
Course Unit Code	İF-B17
Type of Course Unit	Compulsory
Level of Course Unit	2nd year

National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	3
Practice (hour/week)	2
Laboratory (hour/week)	-
Year of Study	2
Semester when the course unit is delivered	4
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. The subject of “Microprocessors and Microcontrollers” also plays an indispensable role in robotics, the military industry, as well as in all information fields. Considering all this, it is clear that studying “Microprocessors and Microcontrollers” is important.

Objectives of the Course:
The course “Microprocessors and Microcontrollers” is the basis for the modern training system of students. It is taught to 2nd year students and its main task is to create a fundamental knowledge base. The goal and main objective of teaching the subject is to form knowledge about microprocessors in students, to study the principles of creating microprocessors, microcontroller systems and their software. In this regard, the main requirements set for the course “Microprocessors and Microcontrollers” are formed. Thus, in industry, they must be able to apply methods and means of ensuring quality control in the areas of production and operation, control and diagnostic systems and complexes without disrupting technological processes.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Explain the goals and objectives of the Microprocessors and Microcontrollers course, scientific research methods, and its relationship with other sciences	1, 2
2	Differentiate the forms of organization of Microprocessors and Microcontrollers training, determines and applies the form appropriate to the topic	1, 2
3	Explain the means of Microprocessors and Microcontrollers training, determines and selects visual aids for a specific lesson	1, 2
4	Explain the principles, training methods (technologies) of Microprocessors and Microcontrollers training	1, 2

5	Explain the goals and objectives of Microprocessors and Microcontrollers training	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	3
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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	5
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3
6	ability to use various types of devices to monitor and control technological processes	4
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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	4
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	3
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		Lecture 1. General information about microprocessors	
2		Lecture 2. Classification of microprocessors	
3		Lecture 3. The role of a microprocessor in the development of technical systems	
4		Lecture 4. The structure of microprocessor control systems	
5		Lecture 5. The structure of a microprocessor controller	
6		Lecture 6. Microprocessor control devices. Technical means of microprocessor systems	
7		Lecture 7. Mainframe-modular architecture of MP systems	

8		Lecture 8. Principles of memory organization and information transfer in microprocessor systems	
9		Lecture 9. Microcontroller devices, their purpose, structure, types and parameters. Popular microcontroller families	
10		Lecture 10. Devices based on PIC microcontrollers and their schematics. Devices based on AVR microcontrollers and their schematics	
11		Lecture 11. A device for listening to noises in internal organs using a microcontroller stethoscope	
12		Lecture No. 12. History of development of computed tomography	
13		Lecture No. 13. Innovative optical technology	
14		Lecture No. 14. The working principle of a digital X-ray system	
15		Lecture No. 15. Types and methods of defibrillation	

Recommended Sources TEXTBOOK(S)

1. Быстрое Ю.А., Мироненко И.Г. Электронные цепи и микросхемотехника. М.: Высшая школа, 2002.
2. Mohammad Shafivulla, Dr. M. A. Naqvi, G. Vijay Kumar Microprocessors and Microcontrollers. LAP LAMBERT Academic Publishing, 2018
3. Padma Charan Sahu, Sunita Panda, Microprocessors and Microcontrollers. LAP LAMBERT Academic Publishing, year 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	**180**
Total Workload/30(h)	**180/30**
ECTS Credit of the Course	**6**

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

Course Unit Title	Fundamentals of device technologies
Course Unit Code	İF-B18
Type of Course Unit	Compulsory
Level of Course Unit	1st year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/week)	-
Year of Study	1
Semester when the course unit is delivered	1
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 "Fundamentals of Device Technologies" belongs to the block of general technical subjects. The subject "Fundamentals of Device Technologies" is intended for all technical specialties of the modern era. Bachelors trained in technical directions in higher education institutions will be able to study in detail the issues of improving the quality and achieving the required accuracy during the design, production technology and operation of devices by mastering the subject "Fundamentals of Device Technologies".

Objectives of the Course:
The main goal of teaching the subject is to instill in future specialists the relevant knowledge about "Fundamentals of Instrumentation Technologies" and to create the ability to effectively use the knowledge they have acquired during the course.
The knowledge acquired will significantly help these specialists in their future work activities.

Learning Outcomes

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

1	The goal and main objective of teaching the subject is to provide future specialists with relevant knowledge about the " Device Technology Basics" and to create in them the ability to effectively use this knowledge in their work. The knowledge acquired will be significantly useful for these specialists in monitoring the operation of devices and installations, maintaining them and improving them.	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		

Course's Contribution to 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	4
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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	5
6	ability to use various types of devices to monitor and control technological processes	4
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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Lecture 1. Introduction to the subject, main topic. Subject of the subject, basic concepts	
2		Lecture 2. Production of equipment parts, main processes. Characteristics of technological methods of production	
3		Lecture 3. Forgings, Forging methods	

4		Lecture 4. Pressure processing. Classification of methods of pressure processing of metals	
5		Lecture 5. Pressure processing of metals, rolling, drawing, pressing	
6		Lecture 6. Pressure processing of metals, free forging	
7		Lecture 7. Pressure processing of metals, stamping	
8		Lecture 8. Metal forgings. Forging metallurgy, methods of obtaining	
9		Lecture 9. Production of metal forgings and metal-ceramic products	
10		Lecture 10. Production of metal-ceramic products. Metal-ceramic materials	
11		Lecture 11. Methods of processing of nuts. Methods of processing of parts with the help of cutting tools	
12		Lecture 12. Methods of processing of nuts. Processing with metal tools	
13		Lecture 13. Methods of processing of nuts. Processing with abrasive tools	
14		Lecture 14. Methods of processing of nuts. Methods of electrochemical processing	
15		Lecture 15. Methods of processing of nuts. Fire processing of metals and alloys	

Recommended Sources TEXTBOOK(S)

1. Abdullayev H.B., İsgəndərzadə Z.A. Yarımкeçirici çeviricilər. Bакı, Elm, 1975
2. Əsgərov T.M., Mahmudov V.A., Bayramov X.T. Elektron hesablama maşınları və sistemlərinin nəzəriyyəsi və layihələndirilməsi. Bакı, 1990.
3. Talibi M.Ə., Qəribov M.H., Hacıyev N.C. Mikroelektronika. Bакı, 1976.
4. Qasımzadə N.H. Metallar və başqa конstruksiya materialları texnologiyası. Bакı, Maarif, 1975.
5. Novruzov H.D. Konstruksiya materiallarının texnologiyası. Bакı, Təhsil, 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	**150**
Total Workload/30(h)	**150/30**
ECTS Credit of the Course	**5**

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

Course Unit Title	Automated device design systems
Course Unit Code	İF-B19
Type of Course Unit	Compulsory
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	3
Practice (hour/week)	2
Laboratory (hour/week)	-
Year of Study	2
Semester when the course unit is delivered	3
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 purpose of teaching the subject "Computer-Aided Device Design Systems" is to instill theoretical knowledge about automated design systems in students and to develop practical knowledge and skills that allow them to solve complex tasks in the field of automated design systems. As a result of teaching the subject, students will gain knowledge about system analysis of design, technical and mathematical support of automated design systems, geometric models and machine graphics, mathematical support of project decision synthesis, support of automated design systems, automated systems for production purposes, and CALS technologies.

Objectives of the Course:

People set a goal in their activities and seek means to achieve that goal. The goal is usually a product of the human mind. The means of achieving the goal, as a rule, are objects with certain functional and production characteristics (structures, systems, processes, programs, etc.). The creation of an object begins with its design. The reason why projects obtained through automated design systems are of very high quality is that the high capabilities of the computers included in the ALS allow for a more in-depth study of the problem based on mathematical modeling and optimization of basic decisions. The main task of the subject "Fundamentals of Automated Design Systems for Devices" is to form theoretical and practical knowledge in students about modern automated design systems and their basic principles.

Learning Outcomes

At the end of the course the student will be able to know		Assessment
1	modern automated design systems and their general terminology	1, 2
2	structure and subsystems of automated design systems	1, 2
3	types of support of automated design systems	1, 2
4	interaction of ALS subsystems in the automated design process	1, 2
5	automation of the design sequence	1, 2
6	development of the ALS structure	1, 2
7	use of the developed ALS for product design	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	4
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	5
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	5
6	ability to use various types of devices to monitor and control technological processes	4
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	4
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	4
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	3

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		Lesson 1. Introduction. General concept. Formation of design science. Summary of research in the field of design methodology	
2		Lesson 2. Design and artificial intelligence. System analysis of design. Principles of a systematic approach Lesson 3. Purpose of design. Design objects. Design process	
3		Lesson 4. Basic principles of ALS. Classification of ALS. Structure of ALS. Design levels of ALS. Design stages of ALS. Design procedures in ALS	
4		Lesson 5. Models in ALS and their parameters. General algorithm of automated design. Product life cycle. Introduction to CALS technologies Lesson 6. General characteristics of technical support. Requirements for technical support of ALS. Computer architecture and structure	
5		Lesson 7. Software data processing tools. Tools for preparing and entering data. Tools for reflecting and documenting data	
6		Lesson 8. Technical means of the archive of project decisions. Tools for distributing data. Interface. Types of computers and computing systems Lesson 9. General characteristics of mathematical support. Morphological description of the design object. Functional description of the design object	
7		Lesson 10. Decision-making methods. Requirements for mathematical models and methods used in ALS Principles of simulation models	
8		Lesson 11. Types of geometric models. Methods and algorithms of computer graphics. Construction of geometric models. Surface models Lesson 12. Optimization criteria. Optimization problems taking into account constraints. Classification of mathematical programming methods	
9		Lesson 13. Methodological support of ALS. Linguistic support of ALS. Management linguistic support. Basic linguistic support	
10		Lesson 14. Language processors. Software support of ALS. General software support. Information support of ALS	
		Lesson 15. Databank. Data security and integrity. Organizational support	
11		Lesson 16. Types of CASE (Computer Aided Software Engineering) systems	

12		Lesson 17. ERP systems. Logistics systems. Automated control systems of technological processes Lesson 18. ALSs for mechanical engineering. Main functions of CAD systems. Main functions of CAE systems	
13		Lesson 19. Main functions of CAM systems. Prototyping. Graphics core. Structure of CAD/CAM systems	
14		Lesson 20. High-level ALS for mechanical engineering. Examples of CAD/CAM/CAE/PDM systems for mechanical engineering and instrument making Lesson 21. Automated product life cycle management systems. Stages of development of CALS technologies	
15		Lesson 22. Strategy and issues of the CALS concept. Basic principles of CALS technology	

Recommended Sources TEXTBOOK(S)

1. Mövlazadə V.Z., Hüseynov H.Ə. Maşınqayırmada texnoloji proseslərin avtomatlaş-dırılmış layihələndirmə sistemləri. Bakı: AzTU, 1990, 113 s
2. Əhmədov M.A., Hüseynov A.H., Məmmədyarov C. F. Avtomatlaşdırılmış layihələndirmə sistemlərinin əsasları, "Sumqayıt" nəşriyyatı, Dərslik, Bakı, 2003, 242 s.
3. Hüseynov H.Ə. Avtomatlaşdırılmış layihələndirmə sistemlərinin əsasları. Bakı: AzTU,1995, 111s.
4. Hüseynov H.Ə., Şükürov A.R. «Metalkəsən dəzgahların avtomatlaşdırılmış layihələndirilməsi», AzTU, 2001, 120 s.
5. Hüseynov H.Ə., Mirzəyev A.M., Əliyev R.R. və b. İnformasiya axtarış sistemlərinin texnoloji təminatı. Bakı: AzTU, 1990, 84s.
6. Гусейнов Г.А. «Программные управление точностью механической отработки», Баку, Чашыоглу, 2000, 282с.
7. Гусейнов Г.А., Багиров С.А. «Программные управление точностью внутреннего шлифования», Баку, Чашыоглу, 2001, 137с.

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 Credit of the Course	**6**

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

Course Unit Title	Physical foundations of information acquisition, modern sensors and transducers
Course Unit Code	İF-B20
Type of Course Unit	Compulsory
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	3
Practice (hour/week)	2
Laboratory (hour/week)	-
Year of Study	2
Semester when the course unit is delivered	3
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 "Physical Basis for Obtaining Information, Modern Sensors and Converters" belongs to the block of general technical subjects. This subject is dedicated to the study of the theory, principles of construction, design and operation of converters and devices intended for collecting primary information, forming control teams and conducting control.

Objectives of the Course:
The main goal of teaching the subject "Physical Basis for Obtaining Information, Modern Sensors and Converters" is to provide future device engineers with information about the physical nature of transducers and sensors, which are the primary source of information acquisition, their operating principles, the creation of their basic circuits, their errors and ways to reduce errors, and to instill the ability to effectively use the knowledge they have acquired 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 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	5
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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	4
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	4
6	ability to use various types of devices to monitor and control technological processes	5
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	4
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Lecture 1. Subject of the subject, general information, Physical foundations of information acquisition, modern sensors and converters, basic concepts of the subject	
2		Lecture 2, 3. Theory of errors of devices. Errors, types, general concepts. Measured parameters. Measurement, units of measurement of physical quantities	
3		Lecture 4, 5, 6. Measurement converters, concepts and definitions. Measuring instruments. Measurement methods, types, classification. General information about signals. Types and characteristics of signals. Signal conversion	

4		Lecture 7, 8. Basic concepts about errors. Methodological and instrumental errors. Rules for ensuring a unified measurement system in the assessment of errors	
5		Lecture 9, 10. Pressure sensors. Methods of measuring pressure. Elements of theory. Spring pressure sensor. Electric distance manometers	
6		Lecture 11, 12. Effects caused by mechanical and thermal effects. Effects resulting from mechanical, thermal, spatial and time effects Effects caused by mechanical and thermal effects	
7		Lecture 13. Methods of measuring pressure. Volumetric method. Manometer method. Piezoelectric effects. Pressure transducers	
8		Lecture 14. Galvanomagnetic, magnetoresistive and thermoresistive effects, temperature transducers	
9		Lecture 15. Types of thermoresistances, materials used and basic calculations. Seebeck effect. Semiconductor thermoresistances	
10		Lecture 16. Thermoelectric method. Methodological errors of temperature sensors	
11		Lecture 17, 18. Galvanomagnetic and magnetoresistive effects. Hall effect. Hall sensors. Metallic temperature sensors. Thermomanometers. Transformer transducers	
12		Lecture 19. Simple transformer displacement converter. Differential circuit of a transformer displacement converter. Moving-coil transformer converter	
13		Lecture 20. Transformer displacement converters	
14		Lecture 21. Radiation and thermal radiation converters Radioactive radiation converters	
15		Lecture 22, 23. Radioactive isotopes used in measuring equipment. Ionizing radiation receivers. Gas discharge meters. Scintillation meters	

Recommended Sources TEXTBOOK(S)

1. Пашаев А.М., Гаджиев Н.Д., Набиев Р.Н., Султанов В.З. Радиолокационные системы УВД. Монография, Баку: «Сада» 2004,
2. Ахмеджанов Р.А. Физические основы получения информации: учеб. пособие /Р.А. Ахмеджанов, А.И. Чередов - Омск, изд-во ОмГТУ, 2008, 184 с., ЭБС

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 Credit of the Course	**6**

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

Course Unit Title	Civil Defense
Course Unit Code	İF-B21
Type of Course Unit	Compulsory
Level of Course Unit	1st year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/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, English

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.

Objectives of the Course:

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 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	2
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	2
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	3
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	3
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		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.Quliyev,O. Salayev,C. Dadaşov,T.Həmzəbəyova "Mülki Müdafiə" Baki – 2022
2. Təbiət yanğınlarına qarşı mübarizə üsulları və taktikaları. EuroFire © İyil 2008
3. "Mülki Müdafiə" fənni üzrə sxemlər albomu Baki-2019
4. Əsas Təhlükəsizlik qaydaları. FHN Bakı-2016
5. Tural Əmirxanlə. İlkin yanğınsöndürmə vasitələri. Bakı 2004
6. Malik Abbasov, Şamil Quliyev. İlk yardim. Bakı 2017
7. Təxirə salınmaz ilk tibbi yardım. FHN Bakı-2015
8. Ocaqov H.O.Fövqəladə hallarda həyat fəaliyyətinin təhlükəsizliyi. Bakı 2010
9. N.M.Hacıyev S.H.Mahmudov. Aqrar sahədə mülkġ müdafġə. Gəncə - 2012
10. Ocaqov H.O. Fövqəladə halların nəticələrinin aradan qaldırılması. Bakı, 2009.
11. Ocaqov H.O. Fövqəladə hallarda həyat fəaliyyətinin təhlükəsizliyi (Ali məktəblər üçün dərslik). Çaşıoğlu, Bakı, 2002
12. Ocaqov H.O. Mülki müdafiə mühafizə qurğuları. 1993
13. Ocaqov H.O. Fövqəladə hallarda həyat fəaliyyətinin təhlükəsizliyi (Mülki müdafiə). Bakı, 2002
14. Ocaqov H.O. Mülki müdafiənin mühafizə qurğuları. Bakı, 2003
15. Ocaqov H.O. Fövqəladə halların idarə olunması. Bakı, 2008
16. Ocaqov H.O., Danyalov Ş.D. Həyat fəaliyyətinin təhlükəsizliyinin nəzəri əsasları. Bakı, 2008
17. "Mülki müdafiə". Kərimov Zabit Səməd Bakı 2013
18. Kərimov Z.S. Həyat fəaliyyətinin təhlükəsizliyi, əməyin mühafizəsi. Bakı, 2016
19. R.Quliyev, O.Salayev, C.Dadaşov, T. Həmzəbəyova Mülki müdafiə Bakı, 2022
20. Azərbaycan Respublikası Fövqəladə Hallar Nazirliyi Akademiyasının rəisi general-mayor Baba Salayev, polkovnik İlham Babaşov, polkovnik-leytenant Rəfail Mustafayev "Xilasedicinin kitabı" Bakı, 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 Compulsory.
- 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 Credit of the Course	**3**

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

Course Unit Title	Programming Languages and computer science
Course Unit Code	ATMF-BO1
Type of Course Unit	Elective
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	2
Semester when the course unit is delivered	3
Course Coordinator	
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:

The course teaches students the fundamentals of computer science and the functionality of programming languages. The course covers basic concepts such as syntax, variables, functions, conditional operators, loops, arrays, file operations, exception handling, and data analysis using the Python language. At the same time, students are taught the skills of testing and error management.

Objectives of the Course:

The goal of this course is to teach students the basic concepts of programming, algorithmic thinking skills using the Python programming language, and how to solve real-world problems with computers. Students will develop their skills in logical thinking, problem analysis, and finding effective solutions through programming.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Will be able to work with the Python programming language	1, 2
2	Will understand program structure and syntax	1, 2
3	Will be able to solve real-world problems by building algorithms	1, 2
4	Will perform file and console I/O operations	1, 2
5	Will be able to control logical flow using conditions and loops	1, 2
6	Will acquire the ability to analyze and visualize data	1, 2
7	Will be able to build simple games and simulation models	1, 2
8	Will be able to detect and handle errors correctly	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	3
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	3

4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	4
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3
6	ability to use various types of devices to monitor and control technological processes	3
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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	5
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	3
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		Introduction Seminar 1	
2		Lecture 1. Programming and the Python Shell	
3		Types and literals Seminar 2	
4		Lecture 2.Variables, statements, and expressions	
5		Functions Seminar 3	
6		Lecture 3.Style	
7		Console I/O Seminar 4	
8		Lecture 4.Branching and Boolean expressions	
9		Structure, development, and testing Seminar 5	
10		Lecture 5.Sequences	
11		Loops and iteration Seminar 6	
12		Lecture 6.Randomness, games, and simulations	

13		File I/O Seminar 7	
14		Lecture 7.Data analysis and presentation	
15		Exception handling Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. Charles Severance – Python for Everybody
2. Allen B. Downey – Think Python
3. Mark Lutz – Learning Python

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 Credit of the Course	**5**

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

Course Unit Title	Technical and object-oriented C programming language
Course Unit Code	ATMF-BO1
Type of Course Unit	Elective
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	2
Semester when the course unit is delivered	3
Course Coordinator	
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:

This course teaches the syntax, structural and object-oriented features of the C++ programming language, as well as OOP concepts such as managing multiple objects, memory management, inheritance, polymorphism, and encapsulation. The course also covers practical areas such as game development and graphical interfaces.

Objectives of the Course:

The goal of this subject is to teach students the principles of object-oriented programming through the C++ language, and to instill the skills of modeling real problems and building software.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Will acquire knowledge about basic syntax and structures in C++	1, 2
2	Will be able to explain the basic principles of object-oriented programming	1, 2

3	Will be able to write programs using classes and objects	1, 2
4	Will be able to manage multiple objects in complex systems	1, 2
5	Will be able to implement the use and management of dynamic memory in C++	1, 2
6	Will be able to work with graphical interfaces and program simple games	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	3
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	4
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3
6	ability to use various types of devices to monitor and control technological processes	3
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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	5
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	3
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		Procedural Python Examples Seminar 1	

2		Lecture 1. Modeling Physical Objects With Object-Oriented Programming	
3		Mental Models Of Objects And The Meaning Of “Self” Seminar 2	
4		Lecture 2.Managing Multiple Objects	
5		Graphical User Interfaces With Pygame Seminar 3	
6		Lecture 3.Object-Oriented Pygame	
7		Pygame Gui Widgets Seminar 4	
8		Lecture 4.Encapsulation	
9		Polymorphism Seminar 5	
10		Lecture 5.Inheritance	
11		Managing Memory Used By Objects Seminar 6	
12		Lecture 6.Using Oop In Game Development	
13		Card Games Seminar 7	
14		Lecture 7.Timers	
15		Scenes Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. Bjarne Stroustrup – The C++ Programming Language
2. Tony Gaddis – Starting Out with C++: From Control Structures through Objects
3. Stanley B. Lippman – C++ Primer

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 Credit of the Course	**5**

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

Course Unit Title	Electromagnetism
Course Unit Code	ATMF -BO2
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	5
Course Coordinator	Rüstəmova Dürdanə Fərhad
Name of Lecturer (s)	Rüstəmova Dürdanə Fərhad

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

Course description:

The subject "Electromagnetism" provides basic information about the basic laws of electromagnetism, methods of analyzing magnetic circuits, basic concepts of electric and magnetic circuits, operating principles of devices, properties, parameters, and their characteristics.

Objectives of the Course:

The goal and main objective of teaching the subject is to provide future specialists with relevant knowledge about "Electromagnetism" 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	Magnetic field and its characteristics	1, 2
2	Electrical and magnetic measuring devices	1, 2
3	Basic laws of magnetic circuits	1, 2
4	About dio-magnets	1, 2
5	About para-magnets	1, 2
6	Ferromagnetic materials	1, 2
7	Magnetic interaction of electric currents	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	5
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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3

5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3
6	ability to use various types of devices to monitor and control technological processes	3
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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Lecture 1. Electric charge and its basic properties. Electric field of a point charge. Principle of superposition of electric fields. Intensity vector flux. Ostrogradsky-Gauss theorem	
2		Seminar 1	
3		Lecture 2. Electric dipole, dipole moment. Electric field of a dipole. Dielectrics. Dielectrics in an electric field. Polarization of dielectrics. Electric induction vector. Gauss theorem for the electric induction vector	
4		Seminar 2	
5		Lecture 3. Conductors in an electric field. Electric capacity of a single wire and capacitor. Energy of a dipole in an electric field. Energy of a charged wire, capacitor and electric field. Volumetric energy density	
6		Seminar 3	
7		Lecture 4. Magnetic field and its characteristics	
8		Seminar 4	
9		Lecture 5. Magnetic circuits. Basic laws of magnetic circuits	
10		Seminar 5	
11		Lecture 6. Magnetic induction. Graphical representation of a magnetic field. Biot-Savart-Laplace law. Superposition principle. Applications of the Biot-Savart-Laplace law	
12		Seminar 6	

13		Lecture 7. Magnetic field of electric current. Magnetic interaction of electric currents	
14		Seminar 7	
15		Lecture 8. Magnetic induction vector flux. Gauss theorem for magnetic fields. Circulation of magnetic induction vector. Law of total current in vacuum	

Recommended Sources

TEXTBOOK(S)

1. V. Nəsirov, G. Aslanov Elektrik və maqnetizm “Adiloğlu” Bakı 2008
2. Friş S.A. Timoryeva A.N. Ümumi fizika kursu. II hissə 1962
3. Abdullayev Y.R. “Elektrik və elektron aparatları” Bakı, Hərbi nəşriyyat, 1999 (II hissə)
4. Kalaşnikov S. Q. Elektrik bəhsi. Bakı,2010. 3. A.O. Mehrabov, G.Ə. Quliyeva,
5. Z.M. Babayev Ümumi fizika kursu “Çaşıoğlu” Bakı 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

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 Credit of the Course	**4**

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

Course Unit Title	Mechatronics Systems
Course Unit Code	ATMF-BO2
Type of Course Unit	Elective
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/week)	-
Year of Study	2
Semester when the course unit is delivered	3
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 "Mechatronics systems" 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, in the detection and destruction of mines.

Objectives of the Course:

The goal is to familiarize students with the role of the subject "Mechatronics Systems" 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 "Mechatronics Systems", and to form the ability to think logically.

Learning Outcomes

At the end of the course the student will be able to		**Assessment**
1	Modeling a mechatronic device based on the given task	1, 2
2	Preparation of the electronics part of the mechatronic device	1, 2
3	Programming and ensuring its operation	1, 2
4	Designing modern electronic devices in general	1, 2
5	Testing designed devices	1, 2
6	Studying the initial stage of device repair	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	4
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	5
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	5
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	5
6	ability to use various types of devices to monitor and control technological processes	5
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	4
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	4
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	3
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		Lecture 1. Introduction to the subject and its subject. History and development of mechatronics	
2		Structure of technical systems. Mechatronics, description, classification, functional analogy and structural elements of technical systems Seminar 1	
3		Lecture 2. Modeling of mechatronic systems Methodology of modeling of mechatronic systems, general structure and mechanical systems	
4		Lecture 3. Basic electronic components in mechatronic systems Resistors, capacitors, coils, diodes, transistors, thyristors, integrated systems and microcomputers	
5		Basic optical-electronic components in mechatronic systems Photodiodes and photocells, phototransistors, photoresistors, pyroelectric detectors, Luminescent diodes, laser diodes. Seminar 2	
6		Design of mechatronic systems Using common components of mechatronic systems, implementation of the design of these systems Seminar 3	
7		Lecture 4. Regulation and control in mechatronic systems About regulation and control processes, automatic regulation systems, quality indicators of regulation and other issues	
8		Main types of automatic regulators About proportional regulators, integral regulators and mutual regulators Seminar 4	
9		Lecture 5. General information about electronic regulators About the principles of implementation of P-, PI- and PID - regulation laws and two-position regulation laws	
10		Lecture 6. General information about sensors. The role of measurement technology in mechatronics, measurement errors, Basic principles of sensor technology	
11		Lecture 7. About geometric, kinematic and dynamic measurement sensors About length measurement technology, strain gauge technology, position sensors, speed sensors, rotation frequency sensors, acceleration sensors, force, torque and pressure sensors. Seminar 5	
12		General information about external impact sensors Types of external impact sensors – temperature sensors, humidity sensors, gas detectors. Seminar 6	
13		Lecture 8. General information about actuators, actors General information about electromechanical actuators, electric motors and piezoelectric actuators	

14		About magnetostrictive and magnetorheological actuators About magnetostrictive actuators, magnetorheological actuators Seminar 7	
15		About hydraulic and thermomechanical actuators Analysis of hydraulic actuators, thermomechanical actuators and all actuators Seminar 8	

Recommended Sources TEXTBOOK(S)

1. Cəfərov S.M. "Mexatronika və robototexnikaya giriş". Mühazirələr konspekti. 2009.
2. Артемьева Т.В. Гидравлика, гидромашины и гидропневмопривод: Учебник / Т.В. Артемьева, Т.М. Лысенко, А.Н. Румянцева, С.П. Стесин. – М.: Академия, 2014. – 352 с.
3. Юревич Е.И. Основы робототехники. - 2-е изд., перераб. и доп. - СПб.: БХВ-Петербург, 2005. - 416 с.
4. İftixar Çələbi, Hüseyn Mirzəyev, Mexatronika sistemləri, 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	**180**
Total Workload/30(h)	**180/30**
ECTS Credit of the Course	**6**

Course Unit Title	Biomedical Devices, Apparatus, Systems and Complexes
Course Unit Code	ATMF-B03
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/week)	
Year of Study	2
Semester when the course unit is delivered	4
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 “Biomedical devices, apparatus, systems and complexes” is one of the specialized subjects taught to students studying at the bachelor's level in the specialty “Mechatronics and robotics engineering”. The subject explains the structure, working principle and structural schemes of biomedical devices, apparatus, systems and complexes. The structure and composition of computer-based medical complexes are studied in the taught subject. In addition, the working principle of computer-based devices is analyzed and their impact characteristics are determined. In this regard, the teaching of the subject in question is relevant.

Objectives of the Course:

The purpose of the "Biomedical Devices, Apparatus, Systems and Complexes" course is to study the development prospects of computerized medical devices and systems for undergraduate students in the "Mechatronics and Robotics Engineering" specialty, to study the structure of computerized medical complexes and their working principles. The purpose of the course is to study the technology of manufacturing and objects of use of various therapeutic and diagnostic medical devices for undergraduate students in this specialty.

Learning Outcomes

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

1	Medical technical devices	1, 2
2	Biopotentials and their recording devices	1, 2
3	Single-channel and multi-channel electrocardiographs	1, 2
4	Galvanization and drug electrophoresis apparatus	1, 2
5	Electrostimulators	1, 2
6	Electrosurgical apparatus	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	4
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	5
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	5
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	5
6	ability to use various types of devices to monitor and control technological processes	5
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	5
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	4
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	3
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		Lecture 1. Introduction. Biomedical technical means	
2		Seminar 1	
3		Lecture 2. Generalized structural scheme of biopotentials and their recorders	
4		Seminar 2	
5		Lecture 3. Electrode, separation and input devices of biopotential recorders	
6		Seminar 3	
7		Lecture 4. Synphase barrier and ways to combat it	
8		Seminar 4	
9		Lecture 5. Biopotential amplifiers. Biopotential amplifiers without galvanic connection	
10		Seminar 5	
11		Lecture 6. Ink recording devices. Thermal recording devices	
12		Seminar 6	
13		Lecture 7. Electrocardiography and electrocardiographs. Single-channel and multi-channel electrocardiograph. Electroencephalography and electroencephalographs. Electrogastrograph and electromyographs	
14		Seminar 7	
15		Lecture 8. Electrification and drug electrophoresis devices. "Potog"-1 device	

Recommended Sources

TEXTBOOK(S)

1. Н.А. Короневский, Е.П. Попечителев, С.П. Серегин, «Медицинские приборы, аппараты, системы и комплексы» Учебник. Курск ОАО «ИПП»Курск» 2009-986 стр.
2. N.T. Abdullayev, K.S. İsmayılova “Tibbi cihazlar, aparatlar, sistemlər və komplekslər” Bakı. Azərnəşr-2018. 305s.
3. Медицинские приборы. Разработка и применение. Москва. Медицинская книга 2004-720 стр.
4. В.Г. Гусев. «Получение информации о параметрах и характеристиках организма и физические методы воздействия на него. Учебное пособие. Москва «Машиностроение» 2004-597 стр.
5. Е.П. Попечителев, Н.А. Кореневский «Электрофизиологическая и фотометрическая медицинская техника», Учебное пособие, Москва «Высшая школа» 2002-470 стр.

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 Credit of the Course	**6**

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

Course Unit Title	Computerized Biomedical Devices
Course Unit Code	ATMF-BO3
Type of Course Unit	Elective
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	2
Practice (hour/week)	2

Laboratory (hour/week)	
Year of Study	2
Semester when the course unit is delivered	4
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 “Computerized Biomedical Devices” is one of the specialized subjects taught to students studying at the bachelor's level in the specialty “Mechatronics and Robotics Engineering”. The subject studied examines the structure and composition of computerized medical complexes. In addition, the working principle of computerized devices is analyzed and their impact characteristics are determined. In this regard, the teaching of the subject in question is relevant.

Objectives of the Course:

The aim of the course “Computerized Biomedical Devices” is to study the development prospects of computerized medical devices and systems, and to study the structure of computerized medical complexes and their working principles for undergraduate students in the specialty “Mechatronics and Robotics Engineering”.

Learning Outcomes

At the end of the course the student will be able to know		Assessment
1	Structure and composition of computerized medical complexes	1, 2
2	Basic principles of processing medical signals by microprocessors	1, 2
3	Computerized electrocardiographic complexes	1, 2
4	Multichannel computerized electromyograph. Electrostimulation methods	1, 2
5	Methods of measuring and processing brain biopotentials, computerized multichannel systems	1, 2
6	Computerized device for measuring blood pressure. Microprocessor-controlled arterial tonometer	1, 2
7	Computerized electrooculograph	1, 2
8	Hearing sensor system. Computerized impedancemetry	1, 2
9	Structure and principle of operation of Dopplerography device	1, 2
10	Computerized device for measuring respiratory parameters. Impedance pneumography	1, 2
11	Computerized thermometer	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation		
Course's Contribution to 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	4
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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	5
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	4
6	ability to use various types of devices to monitor and control technological processes	5
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	5
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	4
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	3
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		Lecture 1. Introduction. Structure and composition of computerized medical complexes	
2		Seminar 1	
3		Lecture 2. Basic parameters of physiological signals. Artifacts	
4		Seminar 2	
5		Lecture 3. Basic principles of processing medical signals by microprocessors	

6		Seminar 3	
7		Lecture 4. Computerized electrocardiographic complexes	
8		Seminar 4	
9		Lecture 5. Measurement of heart rate and processing of signals on a computer	
10		Seminar 5	
11		Lecture 6. Multichannel computerized electromyograph. Electrostimulation methods	
12		Seminar 6	
13		Lecture 7. Methods of measuring and processing brain biopotentials, computerized multichannel systems. Algorithm and software of a computerized system	
14		Seminar 7	
15		Lecture 8. Computerized device for measuring blood pressure. Microprocessor-controlled arterial tonometer	

Recommended Sources

TEXTBOOK(S)

1. Медицинские приборы. Разработка и применение (под ред. И.В. Камышко). М.: Медицинская книга, 2004, -720 с.

2. Рангайян Р.М. Анализ биомедицинских сигналов. Практический подход. М.: Физматлит, 2007, -440 с.

3. Илясов Л.В. Биомедицинская измерительная техника М.: Высшая школа, 2007, с. 342

4. Кулаичев А.П. Компьютерная электрофизиология и функциональная диагностика. М.: Форум – инфра М., 2007, -640 с.

Кореневский Н.А., Попечителев Е.П., Серегин С.П. Медицинские приборы, аппараты, системы и комплексы. Курск, ИПП-курск, 2009, -986 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	**180**
Total Workload/30(h)	**180/30**
ECTS Credit of the Course	**6**

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

Course Unit Title	Laser and Its Application
Course Unit Code	ATMF -BO4
Type of Course Unit	Elective
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/week)	-
Year of Study	2
Semester when the course unit is delivered	4
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.

Objectives of the Course:
The main goal of teaching the subject "Laser and Its Application" is to provide future device engineers with detailed information about lasers, laser radiation, their properties and creation, types, operating principles and areas of application, and to instill in them the ability to effectively use the knowledge they have acquired during the course.

Learning Outcomes

At the end of the course the student will be able to		**Assessment**
1	achieve the main goal set during the course	1, 2
2	fulfill the tasks considered at a high level	1, 2
3	train educated and skilled specialists and to educate a patriotic young generation	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	5
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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	4
6	ability to use various types of devices to monitor and control technological processes	4
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	4
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3

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	3
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		Introduction, brief history of the creation of the laser. Radiation. Spontaneous and stimulated radiation. Absorption. Absorption coefficient Seminar 1	
2		Laser physics. Laser device. Optical quantum generator. Properties of laser radiation. Monochromaticity. Coherence. Focusing. Temperature Seminar 2	
3		Optical resonators, types, structure. Active and passive resonator. Laser resonators by radii of curvature of mirrors Seminar 3	
4		Types of lasers. Solid-state lasers. Gas discharge, gas dynamic and chemical gas lasers Seminar 4	
5		Molecular lasers. Semiconductor lasers, structure Seminar 5	
6		Laser working principle. Active medium and exciter. Quantum amplifier Seminar 6	
7		Laser communication. Military lasers. Lasers in the entertainment industry. Lasers in the field of transport. Laser gadgets. Application of lasers in sports Seminar 7	
8		Holography, history of creation. Physical principles. Leut transfer scheme. Denisuk-Patnieks transfer scheme Holographic photographic materials. Practical areas of use Seminar 8	
9		Holography, history of creation. Physical principles. Leut transfer scheme. Denisuk-Patnieks transfer scheme Holographic photographic materials. Practical areas of use Seminar 9	
10		Holographic database. Storage of the database in memory Seminar 10	
11		Holographic disks. Writing and reading information on disks Seminar 11	
12		Mathematical model. Tensors. Elements of tensor calculus Seminar 12	
13		Building a mathematical model of disks Seminar 13	

14		Developing a mathematical model of writing and reading information on disks Seminar 14	
15		Laser radiation. Danger to the body. Negative effects of laser radiation on the human body. Protection from laser radiation Seminar 15	

Recommended Sources TEXTBOOK(S)

1. R.C. Qasımova, R.Ə. Kərəməliyev, Kvant elektronikasının əsasları, Bakı Universiteti Nəşriyyatı 1991
2. Н.В. Турчина, Л.И. Рудакова, О.И. Суров, Г.Г. Спирин, Т.А. Ющенко, «Физика», Москва, Издательский Дом Дрофа-2000, 671 с.
3. И.В. Савельев, «Курс Обшей Физики. Волны и Оптика». Книга 4. Минск-2001, 256 с.
4. Короленко П. В. Методы компьютерной оптики. Лаборатория когерентной оптики физического факультета МГУ (1997). Дата обращения: 18 августа 2019.
5. Лейт Э., Упатниекс Ю. ФОТОГРАФИРОВАНИЕ С ПОМОЩЬЮ ЛАЗЕРА // Успехи физических наук. - 1965. - Вып. 11. - С.521-538. Дата обращения: 7 мая 2007.
6. Л.В. Тарасов, «Четырнадцать Лекций о Лазерах», Москва-2011, 176 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	**150**
Total Workload/30(h)	**150/30**
ECTS Credit of the Course	**5**

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

Course Unit Title	Laser Technology
Course Unit Code	ATMF-BO4
Type of Course Unit	Elective
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
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 Technology" 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.

Objectives of the Course:

The main goal of teaching the subject "Laser Technology" is to provide future device engineers with detailed information about lasers, laser radiation, their properties and creation, types, operating principles and areas of application, and to instill in them the ability to effectively use the knowledge they have acquired during the course.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	achieve the main goal set during the course	1, 2
2	fulfill the tasks considered at a high level	1, 2

3	train educated and skilled specialists and to educate a patriotic young generation	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	5
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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	4
6	ability to use various types of devices to monitor and control technological processes	4
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	4
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Introduction to Laser Technologies Seminar 1	
2		Fundamentals of Laser Physics Seminar 2	
3		Optical Resonators in Laser Systems Seminar 3	

4		Classification of Lasers – Part I Seminar 4	
5		Classification of Lasers – Part II Seminar 5	
6		Laser Operation Principles Seminar 6	
7		Applications of Lasers in Industry and Society Seminar 7	
8		Introduction to Holography Seminar 8	
9		Advanced Holographic Techniques Seminar 9	
10		Holographic Data Storage Concepts Seminar 10	
11		Holographic Disks: Structure and Functionality Seminar 11	
12		Mathematical Foundations for Laser Modeling Seminar 12	
13		Modeling of Holographic Data Storage Seminar 13	
14		Simulation of Laser Information Processing Seminar 14	
15		Laser Safety and Biological Effects Seminar 15	

Recommended Sources

TEXTBOOK(S)

1. R.C. Qasımova, R.Ə. Kərəməliyev, Kvant elektronikasının əsasları, Bakı Universiteti Nəşriyyatı 1991
2. Н.В. Турчина, Л.И. Рудакова, О.И. Суров, Г.Г. Спирин, Т.А. Ющенко, «Физика», Москва, Издательский Дом Дрофа-2000, 671 с.
3. И.В. Савельев, «Курс Обшей Физики. Волны и Оптика». Книга 4. Минск-2001, 256 с.
4. Короленко П. В. Методы компьютерной оптики. Лаборатория когерентной оптики физического факультета МГУ (1997). Дата обращения: 18 августа 2019.
5. Лейт Э., Упатниекс Ю. ФОТОГРАФИРОВАНИЕ С ПОМОЩЬЮ ЛАЗЕРА // Успехи физических наук. - 1965. - Вып. 11. - С.521-538. Дата обращения: 7 мая 2007.
6. Л.В. Тарасов, «Четырнадцать Лекций о Лазерах», Москва-2011, 176 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	**150**
Total Workload/30(h)	**150/30**
ECTS Credit of the Course	**5**

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

Course Unit Title	Life Safety
Course Unit Code	ATMF-BO5
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hour/week)	2
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Elşən Əmrahov
Name of Lecturer (s)	Elşən Əmrahov
Name of Assistant (s)	-

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

Course description:

Azerbaijan, as a sovereign state, solves all problems in the field of security itself, therefore, when developing a security doctrine, two important aspects should be taken into account.

First, we must remember how many nuclear arsenals there are, their danger to this or that country should be taken into account, and this factor should be taken into account in security programs.

Second, we must not forget that our country borders on states that possess nuclear weapons or have nuclear ammunition reserves on their territory. Therefore, when planning and implementing "Safety of Life" measures, attention should not be reduced to protecting the population, as well as national economic facilities, from weapons of mass destruction (WMD). The security system faces the problem of protection from technogenic and natural disasters.

Objectives of the Course:

• The purpose of "Life safety" is to provide future specialists with the necessary theoretical knowledge and practical experience to create healthy and safe conditions for labor activity. Future specialists, having mastered the training, should have the following knowledge. Issues that constitute labor protection, duties of responsible persons, their responsibility for creating healthy and safe conditions for labor.
• Existing methods of injury and illness.
• Ways to prevent traumatism and harmful production factors.
• Methods and means of creating individual and collective protection that ensure the safety of working conditions.
• Requirements for safety equipment during the installation and repair of electrical appliances.
• Causes of fire, fire prevention and fire extinguishing methods.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Formation of ideas about the methodology, goals and objectives of teaching the subject "Life Safety", scientific research methods, and its relationship with other sciences;	1, 2
2	Formation of ideas about the means of teaching the subject "Life Safety";	1, 2
3	Formation of ideas about the forms of organizing the subject "Life Safety";	1, 2
4	Formation of ideas about the goals and objectives of teaching the subject "Life Safety", scientific research methods, and its relationship with other sciences;	1, 2
5	Formation of ideas about the forms of organizing the training "Life Safety";	1, 2
6	Formation of ideas about the principles of training "Life Safety", training methods;	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 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	2
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	2
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		Topic 1. Introduction. Content and role of the subject	
2		Seminar 1	
3		Topic 2. Meteorological parameters	
4		Topic 3. Causes of industrial injuries and occupational diseases	
5		Seminar 2	
6		Topic 4. Occupational diseases and measures for their prevention	
7		Topic 5. Normalization of meteorological conditions in production	
8		Seminar 3	
9		Topic 6. Main harmful production factors. Industrial and domestic accidents	

10		Topic 7. The effect of noise and vibration on the human body. Industrial dusting	
11		Seminar 4	
12		Topic 8. Heating, ventilation, lighting systems of buildings and hygienic requirements for them	
13		Topic 9. Electrical safety issues. Providing first aid to a victim of electric current	
14		Seminar 5	
15		Topic 10. Electrical injuries. Types of voltage in electrical equipment (low, high, constant and variable), injuries from them	

Recommended Sources

TEXTBOOK(S)

1. Azərbaycan Respublikasının Konstitusiyası. Baki, 1995.
2. Müəssisələrdə texniki təhlükəsizlik və əməyin mühafizəsini təşkilinə dair mühüm aspektlər. Bakı, 2007.
3. Ocaqov H.O. Fövqəladə halların idarə olunması./ dərslik. Bakı, 2008.
4. Ocaqov H.O. Fövqəladə hallarda həyat fəaliyyətinin təhlükəsizliyi./ Mülki müdafiə (mühafizə). Bakı, 2010.
5. Ocaqov H.O. Fövqəladə halların nəticələrinin aradan qaldırılması. Bakı, 2009.
6. Ocaqov H.O.və başqaları. Zəhərli maddələr və onlardan mühafizə./Dərs vəsaiti. Bakı, 1998.
7. Şixəliyev F.A. Əmək mühafizəsi. Bakı 1981
8. Texniki təhlükəsizlik haqqında Azərbaycan Respublikasının Qanunu

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 Credit of the Course	**4**

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

Course Unit Title	Dynamics of Machines and Mechanisms
Course Unit Code	ATMF-BO5
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hour/week)	
Practice (hour/week)	
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Rüstəmova Dürdanə Fərhad
Name of Lecturer (s)	Rüstəmova Dürdanə Fərhad
Name of Assistant (s)	-
Mode of Delivery	Face to face

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

Course description:

The need to study the dynamics of machines and mechanisms arises from the requirements of the development of modern technology. A number of disciplines dealing with the theory and calculation of various devices and machines, for example, the strength of materials, machine parts, the theory of machines and mechanisms, construction mechanics, etc., are based on the provisions of theoretical mechanics. Therefore, the role of theoretical mechanics in the training of highly qualified specialists with comprehensive training, excellent knowledge, and most of the innovations that will arise in the future in connection with scientific and technical progress is indispensable.

Dynamics of machines and mechanisms is a science that deals with the general rules of mechanical motion and equilibrium of material bodies. Theoretical mechanics, which is taught in higher technical schools, is divided into 3 sections. The theory of machines and mechanisms studies the methods of studying the properties of mechanisms and machines and designing their schemes. This course can be conditionally divided into three parts: analysis of mechanisms; synthesis of mechanisms and theory of machines - automata.

The dynamics of machines and mechanisms is the most important part of the course and is of exceptional importance for solving a number of problems of modern technology. In the section on the analysis of mechanisms, the kinematic and dynamic properties of mechanisms are studied based on the schemes given.

In the section on the synthesis of mechanisms, the schemes of mechanisms are designed based on the properties given.

The basis of the theory of machine automata is the construction of control system schemes that ensure the coordinated operation of several executive bodies.

In the modern state of development of science and technology, machines and mechanisms can be defined as follows.

Objectives of the Course:

Ensuring the scientific and methodological preparation of future specialists (Dynamics of machines and mechanisms, purpose and content, forms of organization of training, methods and means, modern training technologies), forming in them the relevant knowledge, skills and habits for the implementation of training, familiarizing them with the accumulated experience in teaching, and forming the ability to think logically.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Explains the goals and objectives of the discipline of dynamics of machines and mechanisms, scientific research methods;	1, 2
2	Dynamics of machines and mechanisms - provides the study of the implementation of the organization and development of mechanical engineering on new grounds;	1, 2
3	The scientific development of mechanics by covering the fields of mechanical engineering - resistance of materials, hydraulics, etc.;	1, 2
4	Formation of basic mechanical knowledge.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	4
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	5
6	ability to use various types of devices to monitor and control technological processes	4
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	4
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Topic №1. Introduction to the subject “Theory of Machines and Mechanisms”	
2		Seminar 1	
3		Topic №2. Structural analysis of mechanisms. Basic concepts	
4		Topic №3. Kinematic pairs. Classification of kinematic pairs	
5		Seminar 2	
6		Topic №4. Kinematic chains	
7		Topic №5. Principle of creation of mechanisms. Assur group	

8		Seminar 3	
9		Topic №6. Degree of freedom of spatial mechanisms	
10		Topic №7. Replacement of higher kinematic pairs with elementary pairs in mechanisms	
11		Seminar 4	
12		Topic №8. Additional degree of freedom. Additional connection condition	
13		Topic №9. Introduction to dynamics	
14		Seminar 5	
15		Topic №10. Basic laws of dynamics	

Recommended Sources

TEXTBOOK(S)

1. Hüseynov N. və Mustafayev S.M. Maşın və mexanizmlər nəzəriyyəsi, Bakı, 1971
2. Kəngərli A.M. Yumruqlu mexanizmlərin öyrənilməsi və layihələndirilməsi, Bakı, 1982
3. Артоболевский И.И. Теория механизмов и машин, Москва, 1985
4. Артоболевский И.И. Механизмы в современной технике, справочник в 5 т., Москва, 1970,1976
5. Вибрация в технике, справочник в 6 т. Москва, 1979,1981
7. Гавриленко В.А. и др. Теория механизмов, Москва, 1973
8. Зиновьев В.А. Курс теории механизмов и машин, Москва, 1960
9. Кожевников С.Н. Теория механизмов и машин, Москва, 1973
10. Кореняко А.С. и др. Курсовое проектирование по теории механизмов и машин, Киев, 1970
11. Левитский Н.И. Теория механизмов и машин, Москва, 1990
12. Рашевский П.К. Курс дифференциальной геометрии, Москва, 1965
13. Фролов К.В. и др. Теория механизмов и механика машин, Москва, 2002
14. Юдин В.А., Петрокас Л.В. Теория механизмов и машин, Москва, 1977
15. Dokumacı Erkan Makinadinamiği, İzmir, 1991
16. Sabuncu Mustafa Makinadinamiği, İstanbul, 1991
17. Ferdinand P. Beer, E. Russel Jonston, Vector Mechanics for Engineers. Dinamics, New York, 1988.

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 Credit of the Course	**4**

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

Course Unit Title	Engineering Mathematics
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 (hour/week)	2
Practice (hour/week)	1

Laboratory (hour/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:
The subject of "Engineering Mathematics" is a discipline that deals with the application of mathematical methods to solve real-world problems, including 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 fields, such as optimizing production, reducing costs, improving product quality, etc.

Objectives of the Course:
The development of "Engineering Mathematics" is associated with the use of new mathematical methods and tools, such as mathematical modeling, differential equations, probability theory, and others. At the same time, extensive knowledge in various fields of application is required, as well as the ability to work with complex data and programming. "Engineering mathematics" 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 complex problems that modernity poses to us.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	know mathematical methods, their application possibilities, for this it is enough to be informed in all areas of mathematics	1, 2
2	have the logic and methodology of applied mathematics, modeling methodology	1, 2
3	have the art of putting actual problems and formalizing them	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3
6	ability to use various types of devices to monitor and control technological processes	3
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	4
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Definition of vector, classification of vectors. Linear operations on vectors Seminar 1	
2		Projection of a vector onto an axis. Vector coordinates Seminar 2	
3		Scalar product of vectors Seminar 3	
4		Vectorial product of vectors. Dependent of three vectors Seminar 4	
5		The concept of a matrix. Types of matrices Seminar 5	
6		Linear operations on matrices. Nonlinear operations on matrices Seminar 6	
7		Determining the determinant of a matrix. Determining the rank of a matrix Seminar 7	
8		Transformation (rotation) of the coordinate system. Systems of linear equations Seminar 8	
9		Eigenvalues of a matrix Seminar 9	

10		Differential calculus. The concept of derivative Seminar 10	
11		Physical and geometric meaning of the derivative Seminar 11	
12		Rules of differential calculus Seminar 12	
13		Integral calculus. Indefinite integral Seminar 13	
14		Definite integral Seminar 14	
15		Applications of differential and integral calculus Seminar 15	
Recommended Sources TEXTBOOK(S) 1. Н.В. Бурмашева, Е.Ю. Просвиряков, С.А. Берестова, ИНЖЕНЕРНАЯ МАТЕМАТИКА, Учебная пособие, Екатеринбург, 2022 2. Н.И. Коршунова ПРИКЛАДНАЯ МАТЕМАТИКА ДЛЯ ЭКОНОМИСТОВ Учебное пособие для бакалавриата, МОСКВА, 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	**120**
Total Workload/30(h)	**120/30**
ECTS Credit of the Course	**4**

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

Course Unit Title	Differential Equations
Course Unit Code	ATMF-BO6
Type of Course Unit	Compulsory
Level of Course Unit	2nd year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hours/week)	2

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 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	5
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	2

4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3
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	3
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	2
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		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		Lecture 2. General information about differential equations. Some problems related to differential equations. General, particular and specific solutions of ordinary differential equations. Cauchy problem Seminar 1	
3		Lecture 3. Separable and separable differential equations with respect to their variables. Homogeneous linear equations	
4		Lecture 4. Separable and separable differential equations with respect to their variables. Homogeneous linear equations Seminar 2	
5		Lecture 5. First-order linear differential equations. Bernoulli equation	
6		Lecture 6. First-order linear differential equations. Bernoulli equation Seminar 3	
7		Lecture 7. Complete differential equations. Integrating multiplication	
8		Lecture 8. Complete differential equations. Integrating multiplication Seminar 4	
9		Lecture 9. General concepts about higher-order differential equations. Reducible second-order differential equations	

10		Lecture 10. General concepts about higher-order differential equations. Reducible second-order differential equations Seminar 5	
11		Lecture 11. Second-order linear differential equations. Second-order linear homogeneous differential equations. Second-order linear homogeneous differential equations with constant coefficients	
12		Lecture 12. Second-order linear differential equations. Second-order linear homogeneous differential equations. Second-order linear homogeneous differential equations with constant coefficients Seminar 6	
13		Lecture 13. System of ordinary differential equations. Basic concepts. Integration of ordinary systems. System of ordinary differential equations with constant coefficients	
14		Lecture 14. System of ordinary differential equations. Basic concepts. Integration of ordinary systems. System of ordinary differential equations with constant coefficients Seminar 7	
15		Lecture 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**

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

Course Unit Title	Engineering Design Systems
Course Unit Code	ATMF -BO9
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	1
Laboratory (hour/week)	-
Year of Study	3
Semester when the course unit is delivered	6
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:
The subject “Engineering Design Systems” 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 familiarize students with the role of the subject "Engineering Design Systems" 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 teaching, to familiarize them with the experience gained in teaching the subject "Engineering Design Systems", and to form the ability to think logically.

Objectives of the Course:
Ensuring the scientific and methodological preparation of future specialists, forming in them the relevant knowledge, skills and habits for implementing education, introducing them to the experience gained in teaching the subject of mechatronics and robotics systems design, 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 systems design 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 mechatronics and robotics systems design	1, 2
3	Formation of ideas about the means of training in mechatronics and robotics systems design	1, 2
4	Formation of ideas about the principles and training methods of training in mechatronics and robotics systems design	1, 2
5	Formation of ideas about the goals and objectives of training in mechatronics and robotics systems design for undergraduate students	1, 2
6	Performance of practical tasks used in the training of the course in mechatronics and robotics systems design for undergraduate students	1, 2
7	Control and investigation of the level of performance of practical tasks	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course’s Contribution to 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	4
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	5
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	4
6	ability to use various types of devices to monitor and control technological processes	3
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	4
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	4
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	3
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		Components of mechatronic systems. Classification of robot motion Seminar 1	
2		Fundamentals of design. Robotic design capabilities Seminar 2	
3		Theoretical foundations of mechatronic systems design Seminar 3	
4		Technical design. Basic approaches to the design process Seminar 4	
5		Design Technical task. Initial design stage Seminar 5	
6		Sketch design. Technical design. Basic design principles Seminar 6	
7		Main goals and methods of project automation Seminar 7	
8		Strategic design Seminar 8	
9		Computer-aided design systems Seminar 9	
10		Types of CAD software. A set of mathematical programs Seminar 10	
11		Software (SW) - a set of machine programs Seminar 11	

12		Linguistic support. Design languages Control languages Seminar 12	
13		Formation of process control commands Seminar 13	
14		Modeling tools in CAD Seminar 14	
15		Geometric Modeling. Wireframe modeling. Seminar 15	

Recommended Sources TEXTBOOK(S)

1. Mayılov Valeh Bayram oğlu, Intellektual sistemlər və texnologiyalar, Bakı-2016
2. Винер Н. Кибернетика. - М.: Сов. радио, 1968
3. Гутштейн А.И. Кибернетика в экономическом регулировании производства. М., Экономика, 1972.
4. Е.И. Юревич Основы робототехники
5. А.Н. Радченко. Ассоциативная память. Нейронные сети. Оптимизация нейропроцессоров. Санкт-Петербург. Наука, 1998.

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 Credit of the Course	**5**

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

Course Unit Title	Optical İnformation Systems
Course Unit Code	ATMF-BO9
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	1
Laboratory (hour/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 "Optical Information Systems" belongs to the block of general technical subjects. The teaching and learning of the course covers the topics of information, concepts of information and data, information transmission, discrete and continuous information, information process, types, properties and classification, concepts of objectivity and subjectivity of information and forms of presentation, and optical information systems.

Objectives of the Course:
The main goal of teaching the subject is to instill in future specialists the relevant knowledge about "Optical Information Systems" and to create the ability to effectively use the knowledge they have acquired during the course. At the same time, they should be able to use various devices, information-measuring systems and complexes, their operating principles, and various types of electronic, optoelectronic, etc. devices to control and manage processes.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	create a foundation for general engineering training in students	1, 2

2	use the theoretical knowledge they have acquired from the Optical Information Systems course in any industrial sectors, organizations, departments, enterprises, and associations that correspond to their professional and qualification level	1, 2
3	instill the ability to apply it in future educational stages by adhering to existing regulations	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	5
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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	4
6	ability to use various types of devices to monitor and control technological processes	4
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	4
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Subject, main concepts and issues of the subject. Information. Concept of information and information. Information transmission Seminar 1	
2		Discrete and continuous information. Information processes. Types, properties, classification of information. Concepts of objectivity and subjectivity of information. Forms of information presentation Seminar 2	

3		Structure and kinematic properties of optical information systems Structure and kinematic properties of optical information systems Seminar 3	
4		Structure and kinematic properties of optical information systems Information systems and technologies. The role of ICT in the formation of knowledge and skills Seminar 4	
5		Structure and kinematic properties of optical information systems ICT and education. The main goal of building an information society Seminar 5	
6		Monitoring the direction of development of information and communication technologies Seminar 6	
7		Development Concept and National Strategy. ICT infrastructure. Information security Seminar 7	
8		Information security. Electronic Government. Regional Projects. Space industry and satellite broadcasting. Personnel training and ICT literacy Seminar 8	
9		Statistical classification of information and communication technology products. Information and communication technologies. Classification of products Seminar 9	
10		Statistical classification of information and communication technology products. Information and communication technologies. Classification of products Seminar 10	
11		Fiber-optic telecommunications. Information Age Seminar 11	
12		Steps of the process of establishing communication using fiber optics. Fiber optic cable Seminar 12	
13		Types of fiber cable. Transmission windows. Fiber optic transmission of security and surveillance solutions Seminar 13	
14		Visual information, its importance and essence. Analog information carriers Seminar 14	
15		Photosensitive materials Seminar 15	

Recommended Sources TEXTBOOK(S)

1. Future Trends in Fiber Optics Communication" (PDF). WCE, London UK. July 2, 2014.
2. Alcatel-Lucent. September 28, 2009. October 18, 2009 tarixində orijinalından arxivləşdirilib.
3. "Guide to Fiber Optics & Permises Cabling". The Fiber Optics Association. İstifadə tarixi: December 22, 2015.
4. Azərbaycan Respublikası Prezidenti yanında Vətəndaşlara Xidmət və Sosialİnnovasiyalar üzrə Dövlət Agentliyi, İnformasiya-kommunikasiya texnologiyalarısahəsində hüquqi aktlar, http://vxsida.gov.az/redirect/index/cat_id/83/MainOrNot/0"Alcatel

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 Credit of the Course	**5**

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

Course Unit Title	Materials and Processes
Course Unit Code	ATMF-BO8
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	2
Practice (hour/week)	1.33

Laboratory (hour/week)	0.66
Year of Study	3
Semester when the course unit is delivered	6
Course Coordinator	Hamidova Gulnar Abdulhamid
Name of Lecturer (s)	Hamidova Gulnar Abdulhamid
Name of Assistant (s)	-
Mode of Delivery	Face to face, Laboratory
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:
The subject "Materials and Processes" teaches materials about the use of conductors, semiconductors, dielectrics, and magnets in device manufacturing, the control of production processes through devices made using them, and methods and means of production control.

Objectives of the Course:
The main goal of teaching the subject is to teach students the properties of device materials, their use for monitoring and controlling production processes, the applied technological regime and the operating principles of equipment. The subject "Materials and Processes" plays a great role in the training of engineering personnel.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Students' mastery of materials about the materials used in the manufacture of devices and the technological processes of device manufacturing	1, 2
2	Formation of general knowledge about the nature, essence of device manufacturing work, tools and means used in students	1, 2
3	Acquaintance with the relationship of device elements with each other and the structure of the processes occurring at this time	1, 2
4	Study of the features of selecting and applying device schemes	1, 2
5	Performance of practical tasks used in the field of "Materials and processes" for students studying at the bachelor's level	1, 2
6	Controlling and investigating the level of performance of practical tasks	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	5

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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	4
6	ability to use various types of devices to monitor and control technological processes	3
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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Lecture 1. Electrotechnical materials and products. Classification of materials. Basic properties of metals, dielectrics and semiconductors	
2		Lecture 2. Electrical properties. Optical properties. Acoustic properties	
3		Lecture 3. Magnetic properties. Thermal properties. Mechanical properties	
4		Lecture 4. Conductive materials. Basic properties of metals. Materials with high conductivity Seminar 1	
5		Lecture 5. Metals of various purposes. Noble metals. High-resistance alloys for resistors and heating devices	
6		Lecture 6. Thermocouple alloys and contact materials. Solders and fluxes. Non-metallic conductive materials	
7		Lecture 7. Semiconductor materials. Electrical conductivity of semiconductors. Specific and additive semiconductors	

8		Lecture 8. Temperature dependence of the specific electrical conductivity of a semiconductor. Effect of mechanical deformation on the electrical conductivity of semiconductors	
9		Lecture 9. Elements and chemical compounds with semiconductor properties. Semiconductor elements. Semiconductor chemical compounds	
10		Lecture 10. Classification of dielectrics. Gaseous dielectrics. Liquid dielectrics. Petroleum electrical insulating oils. Synthetic liquid dielectrics Seminar 2	
11		Lecture 11. Polymer dielectrics. Electrical insulating varnishes and compounds. Elastic thin films. Fibrous materials	
12		Lecture 12. Layered plastics. Plastic masses. Insulating rubbers. Electrical insulating glasses. Ceramic dielectric materials. Mica and materials made of mica	
13		Lecture 13. Active dielectrics. Magnetoelectrics: basic properties, classification, application. Piezoelectrics. Piezoeffect phenomenon	
14		Lecture 14. Pyroelectrics and their application in technology. Electrets, their physical properties and application in technology. Liquid crystals and their application in technology	
15		Lecture 15. Magnetic materials. Classification of substances according to magnetic properties. Types of magnetic materials. “Soft” magnetic materials. “Hard” magnetic materials Seminar 3	

Recommended Sources

TEXTBOOK(S)

1. Orucov A.O., Niftiyev S.N., İbrahimov B.Q. Elektrotexniki materiallar. Ali məktəblər üçün dərslik. Bakı-2009.
2. Mohammad El Saba. Advanced Electronic Engineering Materials & Nanotechnology. Ain Shams University-2020
3. Quliyev Ə.M., Səfiyev E.S., Kərimov Q.M. Elektrotexniki materiallar. –Mütərcim, Bakı I hissə, 2006.
4. Quliyev Ə.M., Səfiyev E.S., Kərimov Q.M. Elektrotexniki materiallar. –Mütərcim, Bakı II hissə, 2007, 145 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	**180**
Total Workload/30(h)	**180/30**
ECTS Credit of the Course	**6**

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

Course Unit Title	Digital Electronics
Course Unit Code	ATMF-B10
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/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 development in all fields 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 it is important to study the basics of electronics.

Objectives of the Course:
The goal and main objective of teaching the subject is to provide future specialists with relevant knowledge about "Digital Electronics" and to create in them the ability to use this knowledge effectively 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	Semiconductor devices and physical processes occurring in them	1, 2
2	Diodes and transistors, physical processes occurring in them and their areas of application	1, 2
3	Basic parameters of logic integrated circuits	1, 2
4	Amplifiers of electrical signals, their types and areas of application	1, 2
5	Digital electronic devices. Integrated triggers	1, 2
6	Pulse signal generators, triggers, multivibrators	1, 2
7	Digital electronic and microelectronic devices	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	3
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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	5

5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3
6	ability to use various types of devices to monitor and control technological processes	4
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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		General information about electronics. Analog and digital electronics Seminar 1	
2		Digital electronics. Parameters of a pulse-shaped digital signal Seminar 2	
3		On digital information and number systems Seminar 3	
4		Logic functions and basic laws of logical algebra Seminar 4	
5		Logic elements and their schematics “OR” and “AND” logic elements Seminar 5	
6		“NO” logic element (inverter). “OR-NO” logic element “AND-NO” logic Element Seminar 6	
7		Basic parameters of logic integrated circuits Seminar 7	
8		Digital electronic devices. Integrated triggers Seminar 8	
9		Asynchronous RS trigger. Synchronous RS-type trigger Seminar 9	
10		Pulse counters Seminar 10	
11		Registers. Circular counters Seminar 11	
12		Non-volatile memory devices (NFD) Seminar 12	
13		Combination devices. Multiplexers Seminar 13	

14		Arbitrary logic devices. Adders. Outputs. Semi-output Seminar 14	
15		Microprocessors and microcontrollers Seminar 15	

Recommended Sources

TEXTBOOK(S)

1. A.A. Abdulayev, A.Ə. Axundov “Rəqəm elektronikasının əsasları” Bakı, 1995.
2. M.N. Yolçuyev, N.S. Axundov. Elektrotexnika və Elektronika. MBM nəşriyyatı, Bakı, 2012.
3. К. Бойт «Цифровая электроника»,Техносфера, Москва, 2007.
4. В.И. Лачин, Савелов Н.С. «Электроника», Ростов-на-Дону, 2007
5. Новиков Ю.В. Основы цифровой схемотехники. Базовые элементы и схемы. Методы проектирования. М. Мир, 2001.
6. Ю.С. Забродин. Промышленная электроника. Издательство "Высшая школа", Москва, 1982.
7. Исаков Ю.А., Платонов А.П., Руденко В.С., и др. Основы промышленной электроники. Издательство "Техника", Киев, 1976.

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 Credit of the Course	**5**

Device Engineering bachelor program, Department of "Programming and İnformation security"

Course Unit Title	Computer Design
Course Unit Code	ATMF-B10
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/week)	-
Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Goshgar Aliyev
Name of Lecturer (s)	Goshgar Aliyev
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani, English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

This discipline provides a comprehensive understanding of the principles and practices involved in the design and organization of computer systems. Students will explore the fundamental building blocks of computers, from logical gates and basic circuits to complex processor architectures and memory hierarchies. The course covers various levels of abstraction in computer design, emphasizing the trade-offs between performance, cost, and power consumption. Practical aspects, including hardware description languages (HDLs) and simulation tools, will be introduced to facilitate hands-on experience in designing and analyzing digital systems.

Objectives of the Course:

- To understand the fundamental concepts of digital logic design and Boolean algebra.
- To learn about the basic components of computer systems, including combinational and sequential circuits, and their operation.
- To grasp the principles of CPU organization, instruction set architectures (ISAs), and pipelining.
- To comprehend memory hierarchies, including caches, main memory, and virtual memory.
- To gain knowledge of I/O organization and interrupt handling mechanisms.
- To develop the ability to design simple computer components using hardware description languages (HDLs).
- To analyze and evaluate the performance of different computer architectures.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	Apply Boolean algebra and logic gates to design basic digital circuits	1, 2
2	Design and analyze combinational and sequential logic circuits	1, 2
3	Describe the structure and function of a basic CPU, including its datapath and control unit	1, 2
4	Explain the concept of instruction set architecture (ISA) and its impact on hardware design	1, 2
5	Analyze the principles of pipelining and identify potential hazards	1, 2
6	Understand different memory organization techniques and cache memory principles	1, 2
7	Explain I/O mechanisms and interrupt-driven data transfer	1, 2
8	Utilize an HDL (e.g., VHDL or Verilog) to model and simulate simple digital systems	1, 2
9	Evaluate the performance metrics of computer systems and compare different architectural approaches	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	3
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	5
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3

6	ability to use various types of devices to monitor and control technological processes	3
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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	5
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	3
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		Lecture 1. Introduction to Computer Design: Overview of computer systems, history, levels of abstraction, and key design metrics (performance, cost, power)	
2		Lecture 2. Digital Logic Fundamentals: Boolean algebra, logic gates (AND, OR, NOT, XOR, NAND, NOR), truth tables	
3		Lecture 3. Combinational Logic Circuits: Half/Full adders, decoders, encoders, multiplexers, demultiplexers	
4		Lecture 4. Sequential Logic Circuits: Latches, flip-flops (SR, D, JK, T), registers, counters	
5		Lecture 5. Finite State Machines (FSMs): Design and analysis of Mealy and Moore machines	
6		Lecture 6. Datapath Design: Registers, ALUs (Arithmetic Logic Units), shifters, and interconnections	
7		Lecture 7. Control Unit Design: Hardwired control and microprogrammed control	
8		Lecture 8. Instruction Set Architectures (ISAs): RISC vs. CISC, addressing modes, instruction formats	
9		Lecture 9. CPU Pipelining: Basic concepts, pipeline hazards (structural, data, control), and mitigation techniques	
10		Lecture 10. Memory Hierarchy: Registers, caches (L1, L2, L3), main memory (RAM, DRAM, SRAM), virtual memory	
11		Lecture 11. Cache Memory Principles: Cache mapping techniques (direct, associative, set-associative), write policies (write-through, write-back)	
12		Lecture 12. Virtual Memory: Paging, segmentation, TLB (Translation Lookaside Buffer)	

13		Lecture 13. Input/Output (I/O) Organization: Programmed I/O, interrupt-driven I/O, DMA (Direct Memory Access)	
14		Lecture 14. Introduction to Hardware Description Languages (HDLs): Basics of VHDL or Verilog for digital circuit description	
15		Lecture 15. Performance Evaluation: CPU performance equations, Amdahl's Law, benchmarking	

Recommended Sources

TEXTBOOK(S)

1. **Computer Organization and Design, RISC-V Edition: The Hardware/Software Interface** by David A. Patterson and John L. Hennessy.
2. **Digital Design and Computer Architecture** by David Harris and Sarah Harris.
3. **Digital Fundamentals** by Thomas L. Floyd.
4. **Computer Architecture: A Quantitative Approach** by John L. Hennessy and David A. Patterson.
5. **Logic and Computer Design Fundamentals** by M. Morris Mano and Charles R. Kime.

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 Credit of the Course	**5**

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

Course Unit Title	Mathematical Logic Problems
Course Unit Code	ATMF-BO7
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hour/week)	2
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	3
Semester when the course unit is delivered	5
Course Coordinator	Faracova Sona Samir
Name of Lecturer (s)	Faracova Sona Samir
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 mathematical logic problems covers the areas of analyzing information given in numerical, graphical and tabular form and discovering patterns, calculating various indicators based on the given information, summarizing information given in numerical, graphical and tabular form, analyzing the mathematical formulation of the problem, assessing the sufficiency of data in arithmetic, algebra and geometry problems, determining whether the information in the conditions is sufficient to solve the problem, anagrams, and verbal tests.	

Objectives of the Course:
The aim of the course is to ensure the formation of mathematical and logical thinking in students. This includes the analysis of information presented in numerical, graphical and tabular form and the detection of regularities, the assessment of the sufficiency of data in arithmetic, algebra and geometry problems, and methods for solving anagrams and verbal tests.

Learning Outcomes

At the end of the course the student will be able to know		Assessment
1	Mathematical logical thinking is a powerful tool for shaping students' thinking style	1, 2
2	Analysis of conditions and selection of conditions necessary for solving the problem	1, 2
3	Analysis of information given in numerical, graphical and tabular form and detection of regularities	1, 2
4	Calculation of various indicators based on the given information	1, 2
5	Generalization of information given in numerical, graphical and tabular form. Analysis of the mathematical formulation of the problem	1, 2
6	Understanding the content of mathematical problems and questions	1, 2
7	Evaluation of the sufficiency of data in arithmetic, algebra and geometry problems	1, 2
8	Determination of whether the information in the conditions is sufficient for solving the problem	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	5
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	2
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	2
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	3
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	2
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		Lecture 1. Passwords. Sequences of numbers	
2		Lecture 2. Explicit and implicit operators Seminar 1	
3		Lecture 3. Selecting a word(s) by analogy	
4		Lecture 4. Finding an incomplete pair by a given logical relationship Seminar 2	
5		Lecture 5. Logical analysis of the text	
6		Lecture 6. Constructing various combinations of figures Seminar 3	
7		Lecture 7. Selecting a figure by analogy	
8		Lecture 8. Rules for differentiating analogous figures Seminar 4	
9		Lecture 9. Classification and solutions of figure tests	
10		Lecture 10. Imaginary connection or separation of parts of a figure Seminar 5	
11		Lecture 11. Opening a folded sheet with cuts	
12		Lecture 12. Rotation, opening, assembly of a figure Seminar 6	
13		Lecture 13. Figure - number relationships	
14		Lecture 14. Methods for solving tests given in the form of a table Seminar 7	
15		Lecture 15. Methods for solving tests given in the form of a graph	

Recommended Sources

TEXTBOOK(S)

1. İsmayılov F. S., Həsənov İ. R. “Məntiqi təfəkkürün inkişaf etdirilməsi üçün İQ test nümunələri” I hissə. Bakı-2010
2. İsmayılov F. S., Həsənov İ. R. “Məntiqi təfəkkürün inkişaf etdirilməsi üçün İQ test nümunələri” II

hissə. Bakı-2010

3. Puza Yayınları, IQ Soru Bankası 2018
4. Metropol Yayınları, IQ Soru Bankası 1, 2 ve 3, 2019.
5. Əsədov R. “Məntiqi təfəkkürü yoxlayan testlər”. Bakı-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	**120**
Total Workload/30(h)	**120/30**
ECTS Credit of the Course	**4**

Device 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)	2
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	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	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	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	2
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		Negation actions on concepts of reasoning	
2		Negation actions on concepts of reasoning Seminar 1	
3		Basic concepts of set theory Operations on sets	

4		Basic concepts of set theory Operations on sets Seminar 2	
5		About find functions. Logical propositions	
6		About find functions. Logical propositions Seminar 3	
7		Truth tables of operations. Operations on logical propositions	
8		Truth tables of operations. Operations on logical propositions Seminar 4	
9		Operations on graphs. Types of graphs. The concept of radius in a graph. The concept of diameter in a graph	
10		Operations on graphs. Types of graphs. The concept of radius in a graph. The concept of diameter in a graph Seminar 5	
11		Information about the basic elements of combinatorics	
12		Information about the basic elements of combinatorics Seminar 6	
13		Examples according to the laws of permutation, arrangement, and combination	
14		Examples according to the laws of permutation, arrangement, and combination 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	**120**
Total Workload/30(h)	**120/30**
ECTS Credits of the Course	**4**

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

Course Unit Title	Intelligent Systems
Course Unit Code	ATMF-BO11
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/week)	-
Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Hamidova Gulnar Abdulhamid

Name of Lecturer (s)	Hamidova Gulnar Abdulhamid
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. The role of electronic devices in increasing the reliability of electrical systems is great. Artificial intelligence is an independent scientific research field formed as a result of achievements in the field of mathematics and logic and on the basis of the knowledge accumulated by mankind about animate and inanimate nature. Intellectual information-retrieval systems consist of a communication system, a knowledge base and a database. Considering all this, it is clear that studying this subject is important.

Objectives of the Course:

The goal and main objective of teaching the subject is to provide future specialists with relevant knowledge about "Intelligent Systems" and to create in them the ability to effectively use this knowledge in their work. The knowledge acquired will be significantly useful for these specialists in maintaining, maintaining and improving areas such as Intelligent Information-Retrieval Systems and Natural Language Communication Systems (NLC-systems).

Learning Outcomes

At the end of the course the student will be able to know		Assessment
1	Natural intellectual system - Man and his main mission	1, 2
2	Philosophical-associative essence of man	1, 2
3	Artificial intelligence - the basis of new information technology	1, 2
4	Intellectual information-search systems	1, 2
5	Intellectual application software packages	1, 2
6	Computational-logic systems	1, 2
7	Intrinsically intellectualized system based on a functional approach	1, 2
8	Structure and design of intellectual systems	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	3
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	5
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	3
6	ability to use various types of devices to monitor and control technological processes	3
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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	5
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	3
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		General concepts. Artificial intelligence	
2		Intelligent information-retrieval systems. Structure and design of intelligent systems Seminar 1	
3		Structure and design of intelligent systems. Design of a knowledge base	
4		Structure of a knowledge base and its interaction with other components of intelligent systems. Level of meta-knowledge Seminar 2	
5		Presentation and modeling of knowledge	
6		Stages of designing intelligent systems Seminar 3	
7		List of works during the design of intelligent systems	
8		Number of stages of designing intelligent systems Seminar 4	
9		Next stages determining the existence of intelligent systems	
10		Analysis of the subject area and methods of obtaining knowledge Seminar 5	

11		Formation of knowledge in the knowledge base of intelligent systems during the study of economic and production systems	
12		Discovery of the source of knowledge. Intellectual agents. Tools used by the expert Seminar 6	
13		Methods of extracting knowledge from a subject expert. Technology of building expert systems	
14		Intellectual editor of the knowledge base Seminar 7	
15		Stages in the process of creating expert systems. Nanotechnology: Man's searches for technology and prospects Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. Андрейчиков, А.В. Интеллектуальные информационные системы: учебник для студ. вузов, обуч. по спец. "Прикладная информатика в экономике" / Андрейчиков А.В., Андрейчикова О.Н. - М.: Финансы и статистика, 2004. - 424 с.
2. Воронов, А.Е. Технология использования экспертных систем / А.Е. Воронов. - М.: Лаборатория книги, 2011. - 109 с.
3. Интеллектуальные системы: учебное пособие / А. Семенов, Н. Соловьев, Е. Чернопрудова, А. Цыганков; Министерство образования и науки Российской Федерации, Федеральное государственное бюджетное образовательное учреждение высшего профессионального образования «Оренбургский государственный университет». - Оренбург: ОГУ, 2013. - 236 с.
4. Кудрявцев, В.Б. Интеллектуальные системы: учебник и практикум для бакалавриата и магистратуры / В.Б. Кудрявцев, Э.Э. Гасанов, А.С. Подколзин. — 2-е изд., испр. и доп. — М.: Издательство Юрайт, 2018. — 219 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	**150**
Total Workload/30(h)	**150/30**
ECTS Credit of the Course	**5**

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

Course Unit Title	Modern Production Processes
Course Unit Code	ATMF-BO11
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/week)	-
Year of Study	4
Semester when the course unit is delivered	7
Course Coordinator	Rəhim Rəhimov
Name of Lecturer (s)	Rəhim Rəhimov
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 modern production process is the basis for the modern training system of students. It is taught to 3rd year students and its main task is to create a fundamental knowledge base, on the basis of which it is possible to develop a deeper and more detailed study of all sections of the subject. In this regard, the main requirements set for the course “Modern Production Process” are formed. From them, the course should be aimed at developing a methodological and worldview. It is necessary to form a single, coherent, logical picture of the surrounding world in students.

The development in all areas of production is achieved as a result of the application of measurement, control, automatic regulation and automatic management systems in these areas, which is directly related to the widespread use of electronic devices. The content of production is determined by the labor process, for which there must be three main elements: labor, labor objects and labor tools. Two types of production are distinguished: material and non-material types. Taking all this into account, it becomes clear that studying this subject is important.

Objectives of the Course:

The goal and main objective of teaching the subject is to provide future specialists with relevant knowledge about the “Modern Production Process” and to create in them the ability to effectively use this knowledge in their work. This subject is closely related to the entire industry, and therefore it is studied on the basis of the laws inherent in the development of the industry as a whole. Therefore, before starting to study the subject “Modern Production Process”, it is necessary to define the concepts of “Industry”, “Production”, “Organization” and “Economy”.

Learning Outcomes

At the end of the course the student will be able to know		Assessment
1	the structure of the enterprise and the directions of its further improvement	1, 2
2	the development of the goals and strategy of the enterprise's development	1, 2
3	the essence of production and the principles of its organization	1, 2
4	the production process and the main requirements for its organization	1, 2
5	the forms of production organization	1, 2
6	the organization of a single, determined and harmonious work of the enterprise	1, 2
7	the standardization of material resources	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course’s Contribution to 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	4
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	5
6	ability to use various types of devices to monitor and control technological processes	3
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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		Methodology of studying the subject. Organizational structure of the enterprise and its determining factors	
2		Types and classification of enterprises. Production structure of the enterprise Seminar 1	
3		Principles of construction of workshops	
4		Production process and its improvement Seminar 2	
5		Main requirements for the efficient organization of the production process. Diversity and classification of the production process	
6		Need to improve the production process Production cycle, its structure and ways to shorten it Seminar 3	
7		Concentration of production. Essence and forms of specialization of production	
8		Cooperatization of production and its forms Seminar 4	
9		Combination of production and its efficiency	

10		Methods of organizing production. Preparation for production and its forms Seminar 5	
11		Planning of technical preparation of production. Design preparation of production and the main requirements for it	
12		Technological preparation of production and the methodology for selecting an efficient option Seminar 6	
13		Development of a new product and its stages	
14		Organization of technical control over product quality Seminar 7	
15		Ways to improve product quality at enterprises. Production dispatching Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. İsayev A.S. Maddi istehsalda fəaliyyət göstərən təsirlər, yaxud texniki-iqtisadi inkişafın yeni tələbləri. Bakı: Azərnəşr, 2009.
2. Quluyev Z.H., Abaszadə R.Q. «Texnoloji proseslərin avtomatlaşdırılmasının müasir texniki vasitələri», Dərs vəsaiti, 2016 – cı il, 304 səh.
3. Осипова Г.И., Миронова Г.В. Экономика и организация производства. Учебное пособие. — М.: МГУП, 2003. — 322 с. — 500 экз. — ISBN 5-8122-0606-6.
4. Непомнящий Е.Г. Экономика и управление предприятием: Конспект лекций. — Таганрог: ТРТУ, 1997. — 374 с.
5. Аврашков, Л.Я. Экономика предприятия: учеб. для вузов / Л.Я. Аврашков, В.В. Адамчук, О.В. Антонова. М.: Банки и биржи: ЮНИТИ, 2008. 742 с.
6. Гоков, А. Организация управления на промышленном предприятии: современные тенденции / А. Гоков // Проблемы теории и практики управления. 2010. № 9. С. 118–126.
7. Грузинов, В.П. Экономика предприятия: учеб. для вузов / В.П. Грузинов. М.: Банки и биржи: ЮНИТИ, 2009. 535 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	**150**
Total Workload/30(h)	**150/30**
ECTS Credit of the Course	**5**

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

Course Unit Title	Nanotechnology
Course Unit Code	ATMF-BO8
Type of Course Unit	Elective
Level of Course Unit	3rd year
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	2
Practice (hour/week)	1.33
Laboratory (hour/week)	0.66
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 subject of "Nanotechnology" is the control and manipulation of processes occurring at the atomic level. Nanotechnology involves the production of new quality materials by manipulating atoms and molecules and the creation of nanoscale machines and mechanisms, robots, computer chips, electronic equipment, optical devices, sensors, chemical and physical cleaners of the environment, and devices for transporting substances, including pharmaceuticals, to living organisms using these materials.
This subject provides students with fundamental and applied knowledge about the production of new quality materials.

Objectives of the Course:
Ensuring the scientific and methodological preparation of future specialists (goals and content of nanotechnology training, forms of organization of training, methods and means, modern training technologies), forming in them the relevant knowledge, skills and habits for implementing training, familiarizing them with the accumulated experience in teaching the subject of nanotechnology, 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 discipline of nanotechnology as a science, scientific research methods, and its relationship with other sciences	1, 2
2	Formation of ideas about the forms of organization of nanotechnology training	1, 2
3	Formation of ideas about the means of nanotechnology training	1, 2
4	Formation of ideas about the principles of nanotechnology training, training methods	1, 2
5	Formation of ideas about the goals and objectives of nanotechnology training for undergraduate students	1, 2
6	Performance of practical tasks used in the training of the nanotechnology course for undergraduate students	1, 2
7	Control and investigation of the level of performance of practical tasks	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		
Course's Contribution to 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	5
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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	3
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	4
6	ability to use various types of devices to monitor and control technological processes	3
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	3
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	3
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	3
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		What is nanotechnology? A new technology based on the achievements of physics, chemistry and engineering sciences - intensive development of nanotechnology	
2		What is nanotechnology? A new technology based on the achievements of physics, chemistry and engineering sciences - intensive development of nanotechnology Seminar 1	
3		Nanotechnology methods. Creation and application of structures, systems and devices with completely new physical and chemical properties at the level of atoms and molecules	
4		Nanotechnology methods. Creation and application of structures, systems and devices with completely new physical and chemical properties at the level of atoms and molecules Seminar 2	
5		Why Nanotechnology? Nanotechnology - the process of obtaining new quality materials by manipulating atoms and molecules and using these materials to create nanoscale machines and mechanisms, robots, computer chips, electronic equipment, optical devices, sensors, chemical and physical cleaners of the environment, devices that transport substances, including medicines, to living organisms	
6		Why Nanotechnology? Nanotechnology - the process of obtaining new quality materials by manipulating atoms and molecules and using these materials to create nanoscale machines and mechanisms, robots, computer chips, electronic equipment, optical devices, sensors, chemical and physical cleaners of the environment, devices that transport substances, including medicines, to living organisms Seminar 3	
7		A new technological era. The use of nanotechnological materials in food packaging, its dense hermetic walls can keep food fresh longer, some packaging can prevent microbes that spoil the products	
8		A new technological era. The use of nanotechnological materials in food packaging, its dense hermetic walls can keep food fresh longer, some packaging can prevent microbes that spoil the products. Seminar 4	
9		Examples. Paints act as a protective coating. Its particles cover any damaged part. Sunscreens contain active ingredients - aluminum oxide. This ingredient absorbs ultraviolet rays. When mixed with sweat, it breaks down on the skin.	
10		Examples. Paints act as a protective coating. Its particles cover any damaged part. Sunscreens contain active ingredients - aluminum oxide. This ingredient absorbs ultraviolet rays. When mixed with sweat, it breaks down on the skin. Seminar 5	

11		Nanoproduction and their technologies. The separated particles successfully protect the skin from sunlight. Italian designer Mauro Taliana has developed a "smart" fabric, which contains titanium, nickel and nylon. The nanostructure of the fibers helps the clothing adapt to climatic conditions: humidity, heat, rain, cold	
12		Nanoproduction and their technologies. The separated particles successfully protect the skin from sunlight. Italian designer Mauro Taliana has developed a "smart" fabric, which contains titanium, nickel and nylon. The nanostructure of the fibers helps the clothing adapt to climatic conditions: humidity, heat, rain, cold Seminar 6	
13		Physical properties of nanomaterials. The nanostructure of the fibers helps the clothing adapt to climatic conditions: humidity, heat, rain, cold. The so-called "shirt for lazy people" is more common. In the heat, its sleeves rise up, and in the cold, on the contrary, they fall down to their full length	
14		Nanoproduction and their technologies. The separated particles successfully protect the skin from sunlight. Italian designer Mauro Taliana has developed a "smart" fabric, which contains titanium, nickel and nylon. The nanostructure of the fibers helps the clothing adapt to climatic conditions: humidity, heat, rain, cold Seminar 7	
15		Uses of nanomaterials. Clothing made of nanofabric can change size depending on the temperature of the wearer's body. If a person is warm, he can be more free, if he is cold, he becomes more tight to the body Seminar 8	

Recommended Sources

TEXTBOOK(S)

5. On a possibility to form small crystallites of gallium selenide via ultrasonic treatment, K. Allahverdiyev, J. Hagen, Z. Salaeva, Phys. Stat. Sol., 1997, v. 163, pp. 123-127.
6. Динамические и Статические Нелинейные Эффекты в Слоистых Кристаллах Типа Селенида Галлия, Э.Ю. Салаев, К.Р. Аллахвердиев, Баку Элм, 1993, 229 стр.
7. Electroluminescent Material, E.Yu. Salaev, B.G. Tagiev, K.R. Allahverdiyev, Patent No i2013 0032, Baku, Azerbaijan, 2014.

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 Credit of the Course	**6**

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

Course Unit Title	Robotics Complexes
Course Unit Code	ATMF-BO12
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/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:
Fundamentals of Industrial Robotics — as a field of technology, it studies robots, their design, construction, control methods, computer systems created for information processing. The development of this field, in turn, affects the rapid development of industrial automation. Because these technologies help reduce the power of the human factor in industry. Interest in this technology has existed since ancient times. Because people wanted to use others instead of themselves. Although this problem was initially solved by using slave labor, in the last few hundred years robots and other automated systems have replaced them. Despite the interest in this field from ancient times, the study of robotics and its study as a science began in the 20th century. Today, the science of robotics is used to solve many industrial, domestic and social problems.

Objectives of the Course:
The goal and main objective of teaching the subject is to form students' knowledge about robotics, to ensure the scientific and methodological preparation of future specialists, to form in them the relevant knowledge, skills and habits for implementing teaching, to familiarize them with the experience gained in teaching the subject of designing new types of robotic systems, and to form and train logical thinking skills.

Learning Outcomes

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

1	Formation of ideas about the goals and objectives of the subject of Fundamentals of Robotics 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 Fundamentals of Robotics	1, 2
3	Formation of ideas about the means of training in Fundamentals of Robotics	1, 2
4	Formation of ideas about the principles and training methods of training in Fundamentals of Robotics	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation

Course's Contribution to 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	3
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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	5
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	5
6	ability to use various types of devices to monitor and control technological processes	5
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	4
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	4
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	3
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		Subject, main concepts and issues of the subject. Universal manipulators Seminar 1	
2		Intelligent systems and technologies. Artificial intelligence	
		Seminar 2	
3		Kinematic schemes of manipulators Seminar 3	
4		Structure of materials of manipulator joints Seminar 4	
5		Materials used in construction materials Seminar 5	
6		The influence of temperature and radiation on the structure of materials Seminar 6	
7		Integral parts of manipulators Seminar 7	
8		Main parts of a manipulation robot Seminar 8	
9		About porous materials Seminar 9	
10		Application areas of porous materials Seminar 10	
11		Main properties of materials of structural elements Seminar 11	
12		Theoretical study of the physical properties of porous materials in contact with liquids Seminar 12	
13		Mathematical devices widely used in the mechanics of manipulator mechanisms. Elements of vector algebra Seminar 13	
14		Understanding the matrix Seminar 14	

15		Voltage. The effect of the state of tension on the electrical conductivity of insulators Seminar 15	

Recommended Sources

TEXTBOOK(S)

1. Mayılov Valeh Bayram oğlu, İntellektual sistemlər və texnologiyalar, Bakı-2016
2. Винер Н. Кибернетика. - М.: Сов. радио, 1968
3. Гутштейн А.И. Кибернетика в экономическом регулировании производства. М., Экономика, 1972.
4. Е.И. Юревич Основы робототехники
5. А.Н. Радченко. Ассоциативная память. Нейронные сети. Оптимизация нейропроцессоров. Санкт-Петербург. Наука, 1998.

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 Credit of the Course	**5**

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

Course Unit Title	Industrial Robots
Course Unit Code	ATMF-BO12
Type of Course Unit	Elective
Level of Course Unit	4th year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	2
Practice (hour/week)	2
Laboratory (hour/week)	
Year of Study	4
Semester when the course unit is delivered	7
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 "Industrial Robots" belongs to the block of general technical subjects. The subject "Industrial Robots" is intended for all technical specialties of the modern era. Bachelors trained in technical directions in higher education institutions will be able to study in detail the issues of designing robots, increasing quality during production technology and operation, and achieving the required results by mastering the subject "Industrial Robots".

Objectives of the Course:
The main goal of teaching the subject "Industrial Robots" is to instill in future specialists the relevant knowledge about "Industrial Robots" and to create the ability to effectively use the knowledge they have acquired during the course. The subject "Industrial Robots" is a type of robot, which is used to carry out certain processes in production processes. This subject deals with industrial robots, their components, structure and working principles, and design.

Learning Outcomes

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

1	achieve accuracy in the design, production technology and operation of robots	1, 2
2	Improve quality in the design, production technology and operation of industrial robots	1, 2
3	Maintain the required productivity	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		

Course's Contribution to 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	3
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	5
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	3
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	5
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	5
6	ability to use various types of devices to monitor and control technological processes	5
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	4
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	4
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	3
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		Introduction to the subject, main topic, basic concepts. Subject and issues of the subject Seminar 1	

2		General understanding of robots. Types of robots and areas of use Seminar 2	
3		Modern industrial robots, classification, general understanding. Their characteristics, structure, components, working principles Seminar 3	
4		Structure and kinematic characteristics of industrial robots Seminar 4	
5		Structure and kinematic characteristics of industrial robots Seminar 5	
6		General information about mechanisms, joints, kinematic pairs, kinematic chain, degrees of freedom Seminar 6	
7		The main mechanism of industrial robots - manipulators, their components, structure. additional degrees of freedom Seminar 7	
8		Structural analysis of manipulator mechanisms, degrees of freedom, maneuverability Seminar 8	
9		Stress-deformation state of manipulator joints. Principal stresses, principal axes, principal planes Seminar 9	
10		Stress-deformation state of manipulator joints. Principal stresses, principal axes, principal planes Seminar 10	
11		Deformations. Plane deformation. Plane stress state. Relationship between deformations and displacements. Generalized Hooke's law Seminar 11	
12		Elements of vector algebra. Operations on vectors. Right and left coordinate systems. Length, projections and direction cosines of a vector Seminar 12	
13		Matrices. Operations on matrices. Determinant, general concept, properties. Tensors. Transformation of coordinates. Basis vectors Seminar 13	
14		Materials. Materials from which industrial robots are made, classification, physical, chemical and mechanical properties Seminar 14	
15		Materials. Materials from which industrial robots are made, classification, physical, chemical and mechanical properties Seminar 15	

Recommended Sources

TEXTBOOK(S)

1. X.M. Heydərov, O.H. Mirzəyev Konstruksiyaları avtomatik layihəetmə sistemləri. Dərslik. Bakı.2012. səh.151.
2. Gülgəzli “Manipulyator mexanizmlərinin mexanikası” mühazirə toplusu, Azərbaycan Qərbi Kaspi

Universiteti, Bakı – 2003.

3. Ландау Л. Д., Лифшиц Е. М. Механика. 5–е изд. — М.: Физматлит, 2012. — 224 с. — («Теоретическая физика», т. I). — ISBN 978–5–9221–0819–5.
4. Suman Lata Tripathi, Parvej Ahmad Alvi, Umashankar Subramaniam, Suman Lata Tripathi, Parvej Ahmad Alvi, Umashankar Subramaniam “Electrical and Electronic Devices, Circuits, and Materials” Publisher: Wiley-Scrivener 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	**150**
Total Workload/30(h)	**150/30**
ECTS Credit of the Course	**5**

Device 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 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	5
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	5
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	5
4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	5
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	5
6	ability to use various types of devices to monitor and control technological processes	5
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	5
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	5
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	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**

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

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	Rustamova D.
Name of Lecturer (s)	Rustamova D.
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

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

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	Rustamova D.
Name of Lecturer (s)	Rustamova D.
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.
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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

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

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	Rustamova D.
Name of Lecturer (s)	Rustamova D.
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

Activities	Number	Duration (hour)	Total Workload(hour)
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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