



Ecology and Environment Department

MODULE HANDBOOK
Bs in Ecology

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and Environment”.

Course Unit Title	History of Azerbaijan	
Course Unit Code	ÜF-B01	
Type of Course Unit	Mandatory	
Level of Course Unit	2 nd year	
National Credits		
Number of ECTS Credits Allocated	5	
Theoretical (hour/week)	1	
Practice (hour/week)	1	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered	4	
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	Face to face	
Prerequisites	-	
Recommended Optional Program Components	-	
<p>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.</p> <p>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.</p>		
<p>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.</p> <p>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.</p>		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	FTN1 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	
2	FTN2 Demonstrate logical and consistent knowledge	
3	FTN3 Write a research paper on the topic in accordance with the methods of scientific research	
4	FTN4 to connect historical events with modern times, to draw conclusions.	
5	FTN5 to apply the methods of comparative analysis, analysis and synthesis	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Azerbaijan in prehistory time	
2		Ancient states in Azerbaijan. Manna, atropatena, ancient albania	
3		Azerbaijan in the III-VII centuries.	
4		Azerbaijan under the arab caliphate	
5		Azerbaijan in the 9th to the early 13 rd centuries	
6		Azerbaijan in the 14 th century to 15 th centuries	
7		Azerbaijan Safavid state	
8		Khanates of Azerbaijan	
9		Azerbaijan in the XIX century	
10		Azerbaijan in the first decades of the 1900s	
11		Azerbaijan Democratic Republic (1918-1920)	
12		Azerbaijan in the 1920-1930s	
13		Azerbaijan during the world war II and after the war	
14		Independent Republic of Azerbaijan (1991- 2020s.)	
15		The second Garabash war and the victory of Azerbaijan	

Recommended Sources

TEXTBOOK(S)

- History of Azerbaijan. Red. M.Abdullayev. Baku, 2015, 2019 412 p.
- The History of the Caucasian Albanians" by Movses Khorenatsi (translated by R. W. Thomson)
- The Politics of Culture in Soviet Azerbaijan, 1920-40, Audrey Altstadt, Published January 12, 2018 by Routledge

- The Azerbaijani Turks: Power and Identity under Russian Rule, Audrey Altstadt, Publisher Hoover Institution Press; 1992
- Sources on the history of Azerbaijan. Edited by S.S. Aliyarov and Y.M. Mahmudov. Baku, Chirag, 2007. 400 p.
- Gasimov X. Azerbaijani culture in the Middle Ages. Baku, Azpoligraf, 2008.
- Aliyev K. Aliyeva F. Azerbaijan in the ancient period. Baku, 1997.
- Velikhanli N.M. Arab geographers-travelers of the 9th-12th centuries about Azerbaijan. Baku, 1974.
- Velikhanli N.M. Arab Caliphate and Azerbaijan. Baku, 1993.
- Mammadzade M.B. National Azerbaijani movement. B., 1922.
- A. M. Shikhsaidov. Caucasian Albania and Its Writing" (Caucasian Albania and Its Writing. 2001.

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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

MODULE HANDBOOK

Ecology bachelor program, Department of “English language center”

Course Unit Title	Business and Academic Communication in a Foreign Language
Course Unit Code	ÜF-B02.01

Type of Course Unit	Full-time Education	
Level of Course Unit		
National Credits		
Number of ECTS Credits Allocated	7	
Theoretical (hour/week)		
Practice (hour/week)	3.5	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered	2	
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 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: <ul style="list-style-type: none"> - 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	<p>The student will grow in their ability to use English to communicate effectively with others in all disciplines.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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,</p>	

	living conditions, educational background or a present or previous job.		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	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 Skill	
13		Unit 3. Social Psychology-Writing skill ; Grammar:Subject-verb agreement; Unit assignment; Critical Thinking Strategy	
14		Unit 3. Social Psychology: Listening 1 ; Note-taking Skill, Listening Skill, Critical Thinking Strategy; Listening 2; Work with the video; Vocabulary Skill	2
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 Tv shows&movies	
37		Review (Units 4-6)	
38		Achievement – 2	
39		Unit 7. Environmental Science-Reading 1; Reading skill; Work with the video	
40		Unit 7. Environmental Science -Reading 2; Critical Thinking Strategy; Vocabulary Skill	
41		Unit 7. Environmental Science -Writing 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)			
– Q: Skills for Success (Reading and Writing) Level 2: Third Edition / Joe McVeigh/ Jennifer Bixby / Oxford University Press, 2020			
– Q: Skills for Success (Listening and Speaking) Level : Third Edition / Margaret Brooks / Oxford University Press, 2020			
– English Vocabulary in Use Elementary Third Edition/ Michael McCarthy, Felicity O’Dell/ Cambridge University Press 2017			
– Basic Oxford Practice Grammar / Norman Coe, Mark Harrison, Ken Paterson/ Oxford University Press 2019			
– Reading & Vocabulary Development 1: Facts & Figures, Fourth Edition / Patricia Ackert and Linda Lee			
– Essential Grammar in Use Fourth edition/ Raymond Murphy/ Cambridge University Press 2015			
Assessment			
Attendance	10%	At least 75% class attendance is compulsory	
Presentation	10%		

Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	
Assessment Criteria		
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Course Policies		
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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		240
Total Workload/30(h)		240/30
ECTS Credit of the Course		7

MODULE HANDBOOK

Ecology bachelor program, Department of "English Language Centre".

Course Unit Title	Business and Academic Communication in a Foreign Language
Course Unit Code	ÜF-B02.02
Type of Course Unit	Mandatory
Level of Course Unit	1
National Credits	
Number of ECTS Credits Allocated	8
Theoretical (hour/week)	
Practice (hour/week)	4
Laboratory (hour/week)	
Year of Study	
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	Azerbaijan,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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Learning Outcomes		
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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.	
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.	
5		
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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	
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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	ability to use the principles of automatic control, know digital computing	

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

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. Are first impression accurate? Note-taking Skill: to summarize a lecture Listening 1: The psychology of first impressions	
6		Unit 1. Sociology. Are first impression accurate? Listening Skill: Listening for main ideas. Listening 2: A review of books about first impression.	
7		Unit 1. Sociology. Are first impression accurate? Work with the video: Interview mistakes. Vocabulary skill: suffixes. Grammar: Auxiliary verbs: do, be, have	
8		Unit 1. Sociology. Are 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 understand words.	
12		Unit 2. Nutritional science. What makes food attractive? Writing skill: Writing descriptive adjectives. Grammar: Use and placement of adjectives	
13		Unit 2. Nutritional science. Why do we change the foods we eat? Listening 1: A billion pounds of spices	
14		Unit 2. Nutritional science. Why do we change the foods we eat? Critical Thinking Strategy : predicting topics and ideas Listening 2: A world of food	
15		Unit 2. Nutritional science. Why do we change the foods we eat? Grammar: Quantifiers with count and noncount nouns	
16		Unit 2. Nutritional science. Why do we change the foods we eat? Pronunciation: links with [j]and [w]. Speaking skill: Giving advice	
17		Unit 3. Information technology. How has technology affected our lives? Reading 1: Cars that think. Reading Skill: taking notes	
18		Unit 3. Information technology. How has technology affected our lives? Reading 2: Classrooms without walls	
19		Unit 3. Information technology. How has technology affected our lives? Vocabulary skill: Synonyms Writing skill: Writing a summary and personal response	
20		Unit 3. Information technology. How has technology affected our lives? Grammar: Parallel structure	
21		Unit 3. Psychology. In what ways is change good or bad? Listening 1: Shaped by change, promoting change. Listening skill: Listening for time markers	
22		Unit 3. Psychology. In what ways is change good or bad? Critical thinking Strategy: summarizing information Listening 2: An interview with Barbara Ehrenreich	
23		Unit 3. Psychology. In what ways is change good or bad? Vocabulary skill: a word web Grammar: Tag questions.	
24		Unit 3. Psychology. In what ways is change good or bad? Pronunciation: Intonation in tag questions Speaking skill: Asking for and giving reasons	
25		Unit 4. Marketing. Does advertising help or harm us? Reading 1: Can targeted ads change you?	
26		Unit 4. Marketing. Does advertising help or harm us? Reading 2: In 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 behaviour? Note-taking skill: A mind map to note opinions Listening 1: Targeting children with advertising	
30		Unit 4. Marketing. How does advertising affect our behaviour? Listening skill: Fact and opinion Listening 2: The influence of online ads	
31		Unit 4. Marketing. How does advertising affect our behaviour? Vocabulary skill: Context clues to identify meaning Grammar: Modals expressing attitude	
32		Unit 4. Marketing. How does advertising affect our behaviour? 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+prepositions	
57		Unit 8. Behavioral studies. What does it take to be successful? Writing skill: Writing an argumentative essay Grammar: Sentence fragments	
58		Unit 8. Behavioral studies. What can we learn from success and failure? Listening 1: Learning from failure Listening skill: listening for examples	
59		Unit 8. Behavioral studies. What can we learn from success and failure? Listening 2: An interview with Mohannad Abu-dayyah Vocabulary skill: prefixes	

		Grammar: Simple past and present perfect	
60		Unit 8. Behavioral studies. What can we learn from success and failure? Pronunciation: Varying intonation to maintain interest Speaking skill: Asking for and giving clarification	
Recommended Sources TEXTBOOK(S)			
<ul style="list-style-type: none"> – Q: Skills for Success (Reading and Writing) Level 3: Third Edition / Colin S.Ward/ Margot F.Gramer/ Oxford University Press, 2020 – Q: Skills for Success (Listening and Speaking) Level 3: Third Edition / Miles Craven / Oxford University Press, 2020 – English Vocabulary in Use Third Edition/Michael McCarthy, Felicity O’Dell/ Cambridge University Press2017 – Basic Oxford Practice Grammar / Norman Coe, Mark Harrison, Ken Paterson/ Oxford University Press 2019 – Reading & Vocabulary Development 1: Facts & Figures, Fourth Edition / Patricia Ackert and Linda Lee – 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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			8

MODULE HANDBOOK

Ecology bachelor program, Department of "Azerbaijani language and literature".

Course Unit Title	Academic and business communication in the Azerbaijani language	
Course Unit Code	ÜF-B01	
Type of Course Unit		
Level of Course Unit	1 year	
National Credits		
Number of ECTS Credits Allocated	4	
Theoretical (hour/week)		
Practice (hour/week)	1.5	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered	1	
Course Coordinator	Solmaz Alasgarova	
Name of Lecturer (s)	Solmaz Alasgarova	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijan	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description: The subject of "Business and Academic Communication in Azerbaijani" emerged based on a certain need and demand. In the conditions of globalization, the correct and fluent use of the Azerbaijani language in accordance with the requirements of the time, as well as fluent speech in this language regardless of specialization.		
Objectives of the Course: Within the framework of this subject, special attention should be paid to instilling in students the skills of making presentations in Azerbaijani, public speaking, and academic and business writing.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	To acquire information about the Azerbaijani language and the state care shown to it in the conditions 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, levels of communication.	
2	To master the role of auxiliary parts of speech in the process of academic communication; 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. To know what communication rhetoric consists of, the styles of the literary language, the active and passive lexicon of the Azerbaijani literary language. To master literary language and communicativeness, types of communicativeness, communication and communicative strategy in communicativeness and creative technologies.	

3	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.	
4	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.	
5	To learn information about the language of official business documents; to acquire information about the types and forms of business communications, as well as about 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. To be able to prepare written and oral presentations in the Azerbaijani language on the specialty.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		Information about the subject. Objectives and tasks of the subject. Language and speech. Information about the language. Azerbaijani language. Decisions, decrees and laws on the Azerbaijani state language.	
2		Speech culture and the art of oratory. The relationship of the art of oratory with other sciences.	
3		Forms of speech. Written speech and oral speech. Different aspects of written speech and oral speech. Features of oral speech. Improving oral speech skills.	
4		Communication. Business communication culture.	
5		Discussion and listening culture. Ethical issues of speech. Speech etiquette.	
6		Expressive actions that complement oral speech. Body language. Mimicry, gesture.	
7		Literary language. Norms of literary language. Phonetic norm. Expectation of orthographic norm in academic and business communication. Abbreviations. Punctuation marks.	
8		Expectation of orthoepic norms in academic and business communication. Expressiveness of speech. Stress, intonation.	
9		Lexical norms. Expectation of lexical norms in academic and business communication. Use of terms, synonyms, idioms, etc.	
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.).	
11		Auxiliary parts of speech, their stylistic possibilities in speech.	
12		Types of speech: dialogical speech, monological speech, polylogical speech.	
13		Basic requirements for cultural speech.	
14		Style and stylistics. Functional styles of the Azerbaijani language.	
15		Scientific style. Rules for written and oral presentation of lectures, scientific papers, essays, scientific reports, summaries, etc.	
16		Publicistic style. Preparation of academic and business articles in a publicistic style.	
17		Official-business style: business correspondence, rules for writing business documents.	
18		Preparation of business advertisements and bulletin boards.	
19		Epistolary style: rules for official and electronic correspondence. Business correspondence.	
20		Areas of oratory.	
21		Academic oratory. Business rhetoric. Correct construction of business and academic speech.	
22		The procedure and content of writing CVs. Questionnaires and	

		surveys. Rules for preparing project questionnaires.	
23		Business meetings. Organization of business meetings. Participation in business meetings	
<p>Recommended Sources</p> <p>TEXTBOOK(S)</p> <ul style="list-style-type: none"> – Khalilov Buludkhan. Business and academic communication in the Azerbaijani language. Baku, 2021. – Shiriyev Fikrat. Speech culture and communication of the Azerbaijani language. Baku, 2021. – Babayev Adil. Azerbaijani language and speech culture. Baku, 2011. – Mammadli N. Business and academic communication in the Azerbaijani language. Baku, 2021. – Abdullayev Nadir. Fundamentals of speech culture. Baku, 2013. – Fataliyeva V. Communication in the native language. Baku, 2021. – Bayramov R. Trust your word. Baku, 2016. – Novarro Joe, Karlins Marvin. Body language. Baku, 2015. – Gurbanov A.M. Modern Azerbaijani literary language. Baku, 2003. – Demirchizade A. Modern Azerbaijani language part I. Phonetics, orthoepy, orthography. Baku, 2007. – Jafarov S. Modern Azerbaijani language. Part II. Lexicon. Baku, 2007. – Huseynzade M. Modern Azerbaijani language. Part III. Morphology. Baku, 2007. – Abdullayev A., Seyidov Y., Hasanov A. Modern Azerbaijani language. Part IV. Syntax. Baku, 2007. – G. Mustafayeva. Stylistics of the Azerbaijani language. Baku, 2010. – Suleyman Huseynov, Elvira Karajayeva. Azerbaijani language and speech culture (textbook), Baku, 2016. – Abdulhasanli T.A., Zulfugarli (Huseynova) S.R, Rza A.R. Azerbaijani language and speech culture, Baku, 2014. – Dale Carnegie. How to win friends and influence people. Baku, 2007. – Balakishiyev Sh., Namazov I. Practical writing examples. Baku, 2006. 			
Assessment			
Attendance	10%	At least 75% class attendance is compulsory	
Presentation	10%		
Quiz	0%		
Seminars	30%		
Midterm Exam	0%		
Final Exam	50%		
Total	100%		
Assessment Criteria			
Final grades are determined according to the Academic Regulations of WCU			
Course Policies			
<ul style="list-style-type: none"> • 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	240		
Total Workload/30(h)	240/30		
ECTS Credit of the Course	4		

MODULE HANDBOOK

Ecology bachelor program, Department of "Philosophy".

Course Unit Title	Philosophy		
Course Unit Code	ÜFS-B01		
Type of Course Unit	Selection		
Level of Course Unit	2		
National Credits			
Number of ECTS Credits Allocated	3		
Theoretical (hour/week)	0.5		
Practice (hour/week)	0.5		
Laboratory (hour/week)			
Year of Study			
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: Philosophy is a scientific worldview about nature, society, and man. Based on scientific knowledge, philosophy forms a generalized worldview about nature, society, and man in man and helps to provide a logical analysis of existence.			
Objectives of the Course: By providing students with spiritual knowledge about nature, society, and humanity, it aims to form a scientific and philosophical worldview in them, and to form logical thinking so that they can understand and analyze the world.			
Learning Outcomes. To form modern approaches to the study of natural and social phenomena, the ability to collect and analyze empirical data, the rules for compiling scientific work, and the ability to summarize and analyze research results.			
At the end of the course the student will be able to			Assessment
1	To form modern approaches to the study of natural and social phenomena, the ability to collect and analyze empirical data, the rules for compiling scientific work, and the ability to summarize and analyze research results.		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
Course's Contribution to Program			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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 course. The subject of philosophy and the main areas of philosophy.	
2		Basic philosophical concepts: being, human personality (part I).	
3		Basic philosophical concepts: being, human personality (part II).	
4		Approaches to the existence of the "soul, mind" in philosophy.	
5		The problem of "free will" in philosophy.	
6		Communication theories. Logical errors in argumentation (part I).	
7		Communication theories. Logical errors in argumentation (part II).	
8		Political Philosophy (Introduction): discussion of the main concepts	
9		Economics and Philosophy.	
10		Philosophy and the Concept of Justice.	
11		Philosophy and the Concept of Justice.	
12		Consciousness, brain and computers (artificial intelligence).	
13		Philosophy and the meaning of life: philosophical practices in our everyday lives.	
14		Philosophy and ecological problems.	
15		Time and space in philosophy.	

Recommended Sources
TEXTBOOK(S)

- Arendt Hannah, “Human Condition”, The University of Chicago Press, Chicago & London, 2d edition, 1998.
- Arendt Hannah, “The origins of totalitarianism”, A Harvest Book Harcourt Brace & Company, San Diego NY London, 1979.
- Becker Gary S., “Human Capital: A THEORETICAL AND EMPIRICAL ANALYSIS, WITH SPECIAL REFERENCE TO EDUCATION”, The University of Chicago Press Ltd., London, 1993.
- Aristotle, Politics.
- Beebee, Helen, Free Will: An Introduction, Palgrave, 2013.
- Cassin Barbara, “Dictionary of Untranslatables: A Philosophical Lexicon”, Princeton University Press 2014.
- Craig Edward, “Philosophy: A very short Introduction”, Oxford University Press Inc., New York 2002
- Eco Umberto, “Eternal Fascism: Fourteen Ways of Looking at a Blackshirt “Writing in New York Review of Books, 22 June 1995, pp.12-15.
- Esping-Andersen Gosta, “The three worlds of welfare capitalism”, Princeton University Press, Princeton New Jersey, 1990.
- Fresco Jacque, “The best money can’t buy: Beyond Politics, Poverty and War”, Global Cyber Visions, 2002.
- Fullerton George Stuart, “An Introduction to Philosophy”, The MacMillan Company, London: Macmillan & Co., Ltd 1915.
- Habermas Jurgen, “The concept of human dignity and the realistic utopia of human rights”, Journal Compilation Metaphilosophy LLC and Blackwell Publishing Ltd., Vol. 41 #4, July 2010.
- Hayek F.A., “The Road to Serfdom”, University of Chicago Press, 1944.
- Hobbes Thomas, “Leviathan”.
- Hume David, “Treatise of Human Nature” (Book I, Section VI “Of Personal Identity”), ed. 1896, Oxford.
- Krugman Paul, Venables Anthony J., “Globalization and Inequality of Nations”, The Quarterly Journal of Economics, Vol. 110, No.4, November, 1995.
- Kurzweil Ray, “The Singularity is Near: when humans transcend biology”, Penguin Books Ltd., London, 2005.
- Locke John, “An Essay Concerning Human Understanding” (Chapter XXVII “Of Identity and Diversity”), 2nd Edition.
- Locke John, “Second Treatise of Government”.
- [Ludwig von Mises](#), [Bettina Bien Greaves](#) (Editor), “Human Action: A treatise on Economics”, Liberty Fund Inc., 2010.
- Machiavelli, “The Prince”.
- Marx Karl “Capital, A new abridgement”, edited by David McLellan, Oxford University Press Inc., NY, 2008.
- McGinn Colin, “Consciousness and Its objects”, Clarendon Press, Oxford, 2004.
- McTaggart J. Ellis, “The Unreality of Time”, Mind, Volume XVII, Issue 4, 1 January 1908, Pages 457–474.
- Perry John, “Personal Identity”, University of California Press, 1975.
- Piketty Thomas, “Capital in the twenty- first century”, President and Fellows of Harvard College, 2014.
- Plato, “Republic”.
- Plato, “Trial and Death of Socrates”.
- Rousseau Jean-Jacques, Political Writings.
- Russel Bertrand, “A HISTORY OF WESTERN PHILOSOPHY And Its Connection with Political and Social Circumstances from the Earliest Times to the Present Day”, Simon and Shuster, New York, 1945
- Samson Alain, Gigerenzer Gerd, “The Behavioral Economics Guide 2016”, Published on www.behavioraleconomics.com by Behavioral Science Solutions Ltd.
- Sen Amartya “On economic inequality”, OUP Oxford, 1997.
- Smith Adam, “The wealth of nations”
- Spirkin A., “Fundamentals of Philosophy”, Moscow, 2016.
- Turing, A. (1950). Computing Machinery and Intelligence. Mind, 59, 433 – 460.
- Yunus Muhammad “Creating a world without poverty: social business and the future of capitalism”, global urban development, Volume 4, Issue 2, November 2008.
- Watson, Gary (ed.), Free Will, Oxford University Press, 2003.
- Williams Bernard, “The Self and the Future” [Philosophical Review](#) 79 (2):161-180 (1970).

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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			3

MODULE HANDBOOK

Ecology bachelor program, Department of "Philosophy".

Course Unit Title	Introduction to multiculturalism
Course Unit Code	ÜFS-B01
Type of Course Unit	Selection
Level of Course Unit	2 year
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hour/week)	0.5
Practice (hour/week)	0.5
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	3

Course Coordinator	Elvin Khudaverdiyev	
Name of Lecturer (s)	Elvin Khudaverdiyev	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description: Introduction to Multiculturalism is a course that explores the coexistence and interaction of different cultures, ethnic groups, and social identities. This course introduces students to the values, customs, and worldviews of different cultures.		
Objectives of the Course: The aim of the course Introduction to Multiculturalism is to understand the interrelationships of different cultures and ethnic groups, to appreciate the value of cultural diversity, and to promote social harmony. This course teaches students the principles of multiculturalism, intercultural communication, and integration processes, as well as discussing issues of social justice, equality, and human rights. As a result, students acquire the knowledge and skills that will contribute to the development of positive relations between different cultures.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	The outcomes of the Introduction to Multiculturalism course include understanding cultures, increasing empathy and respect, developing tolerance, increasing social knowledge, strengthening communication skills, promoting integration and social harmony, and developing critical thinking skills.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing	

	information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		The subject and importance of the subject of introduction to multiculturalism.	
2		Religious diversity. The essence of religion and its forms of manifestation.	
3		World religions.	
4		National religions.	
5		Ethnic diversity and the national idea.	
6		Multiculturalism as an effective policy model for regulating ethnic-cultural diversity.	
7		Ethnic-cultural diversity and its regulation in Western countries in the modern era.	
8		Multiculturalism in Azerbaijan in the modern era.	

Recommended Sources

TEXTBOOK(S)

- Guliyev, R. (2015). Fundamentals of multiculturalism.
- Khudaverdiyev Elvin - Multiculturalism Policy of Azerbaijan (2023).
- Mammadov, A. (2018). Multiculturalism in Azerbaijani Society.
- Aliyeva, S. (2020). Cultural Diversity and Social Harmony.
- Kymlicka, W. (1995). Multicultural Citizenship: A Liberal Theory of Minority Rights.
- Taylor, C. (1992). Multiculturalism and the Politics of Recognition.
- Parekh, B. (2000). Rethinking Multiculturalism: Cultural Diversity and Political Theory.
- E. Goffman " **Society and Culture** "
- "**Global Mədəniyyət**" - M. Featherstone

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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			3

MODULE HANDBOOK

Ecology bachelor program, Department of "Psychology and social work".

Course Unit Title	Sociology
Course Unit Code	ÜFS-B01
Type of Course Unit	Selection
Level of Course Unit	2
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hour/week)	0.5
Practice (hour/week)	0.5
Laboratory (hour/week)	
Year of Study	2
Semester when the course unit is delivered	1
Course Coordinator	Azar Gasimov
Name of Lecturer (s)	Azar Gasimov
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
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.

Welcome to the Sociology course, one of the elective subjects of the bachelor's degree you are taking. The main objective of this subject is to provide students with fundamental knowledge about the structure of society, social institutions, social changes and the study of human behavior in a social context. The subject of Sociology teaches students to analyze social phenomena with a scientific approach, understand the relationships between different layers of society and develop analytical thinking skills to investigate social problems.

In addition, the course aims to equip students with social theories, empirical research methods and concepts that are essential for investigating the impact of social structures on individuals and groups. As a result, students develop a deeper understanding of how society works and the ability to propose solutions to social problems.

The objectives of the subject are as follows:

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

To strengthen analytical and critical thinking skills, and to instill the ability to analyze empirical research.

Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Students who successfully complete this course will have the following knowledge and skills: Knowledge: Will be able to explain the basic concepts, theoretical orientations, and research methods of sociology.	
2	They will analyze the functions of social institutions (family, education, religion, economy, politics) and their impact on society. They will be able to explain the processes of social stratification, social mobility and social change They will understand the causes and consequences of social problems (gender inequality, poverty, ethnic and racial relations, crime, etc.). They will gain information about globalization, urbanization and contemporary	

	social trends.	
3	<p>Skills:</p> <ul style="list-style-type: none"> • 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.). • They will approach social problems critically and develop analytical thinking skills to solve them. • They will analyze the relationships between social groups and individuals and evaluate the activities of social institutions. • They will be able to apply the theoretical knowledge they have acquired in social policy, business, media and other fields. <p>These training outcomes will ensure that students master sociological knowledge, develop scientific thinking and research skills, understand the social processes of society and analyze them and present solutions.</p>	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
Course's Contribution to Program		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	

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			
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)				
Course Contents				
Week	Chapter	Topics	Exam	
1		Sociology as a science		
2		Society as a complex social phenomenon		
3		Person as a social system		
4		Concept of social structure		
5		Sociology of social-ethnic relations		
6		Social territorial associations		
7		Religion and sociology		
8		Education and sociology		
Recommended Sources				
TEXTBOOK(S)				
<ul style="list-style-type: none"> – Giddens, A. (2009). <i>Sociology</i>. Polity Press. – Macionis, J. J. (2018). <i>Sociology</i>. Pearson. – Ritzer, G. (2021). <i>Sociological Theory</i>. McGraw-Hill. – Haralambos, M., & Holborn, M. (2013). <i>Sociology: Themes and Perspectives</i>. Collins. – Berger, P. L., & Luckmann, T. (1966). <i>The Social Construction of Reality: A Treatise in the Sociology of Knowledge</i>. Penguin Books – Durkheim, É. (1897). <i>Suicide: A Study in Sociology</i>. The Free Press. – Weber, M. (1978). <i>Economy and Society: An Outline of Interpretive Sociology</i>. University of California Press. – Mills, C. W. (1959). <i>The Sociological Imagination</i>. Oxford University Press. – Collins, R. (1994). <i>Four Sociological Traditions</i>. Oxford University Press. – Bauman, Z. (2000). <i>Liquid Modernity</i>. Polity Press. 				
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				
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			3

MODULE HANDBOOK

Ecology 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	Selection	
Level of Course Unit	2	
National Credits		
Number of ECTS Credits Allocated	3	
Theoretical (hour/week)	0.5	
Practice (hour/week)	0.5	
Laboratory (hour/week)		
Year of Study	2	
Semester when the course unit is delivered	3	
Course Coordinator	Arzu Hajiyeva	
Name of Lecturer (s)	Arzu Hajiyeva	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description: The course covers the concept, structure, stages of development of the constitution, the concept and content of human and civil rights and freedoms, as well as the concept of law, and the stages of formation of the legal system in Azerbaijan.		
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.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		

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

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

Course Contents

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

Recommended Sources

TEXTBOOK(S)			
<ul style="list-style-type: none"> - Constitution of the Republic of Azerbaijan. - S.S. Allahverdiyev. Fundamentals of the Constitution and Law of the Republic of Azerbaijan. Textbook. Baku, 2012. - Editor. V.V. Lazarev. General Law and State Theory. Baku, 2007. - S.S. Allahverdiyev. Fundamentals of the Constitution and Law of the Republic of Azerbaijan. Textbook. Baku, 2010. - Frederic Bastiat. Law. Baku.,2007. - Constitutional Law of the Republic of Azerbaijan "On Normative Legal Acts". Baku.,2011. 			
Assessment			
Attendance	10%	At least 75% class attendance is compulsory	
Presentation	10%		
Quiz	0%		
Seminars	30%		
Midterm Exam	0%		
Final Exam	50%		
Total	100%		
Assessment Criteria			
Final grades are determined according to the Academic Regulations of WCU			
Course Policies			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			3

MODULE HANDBOOK

Ecology bachelor program, Department of "Philosophy".

Course Unit Title	Logic
Course Unit Code	ÜFS-B01
Type of Course Unit	Selection

Level of Course Unit	1	
National Credits		
Number of ECTS Credits Allocated	3	
Theoretical (hour/week)	0.5	
Practice (hour/week)	0.5	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered	1	
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 an approach to logic as a branch of philosophy through brain work, language, deductive and inductive logic, the art of reasoning, and classroom discussions. The main focus is on the study of the mechanism of argumentation and expression of ideas. Special attention is paid to logical fallacies. The problems and challenges of the modern era will also be analyzed and discussed.		
Objectives of the Course: Students should leave this course with an understanding of the basic concepts of logic; demonstrating an understanding of the central questions of logic as a field of philosophy, familiarity with the art of reasoning, and an understanding of the major challenges of the modern age.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	studying the content of the subjects and problems of the subject, their main concepts and their use in other philosophical and humanitarian subjects.	
2	The student must be able to freely analyze the ideas of philosophical schools and compare them.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological	

	processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Wee k	Chapter	Topics	Exam
1		Logic as a branch of philosophy. Course Objectives. The Work of the Brain.	
2		Language, Mind and Logic. The "Triad" Theory of the Mind.	
3		Logic as a branch of philosophy. Language, Mind and Logic.	
4		Logic and Ludwig Wittgenstein's Theories of Language.	
5		Logic and Ludwig Wittgenstein's Theories of Language.	
6		Logic and Classification Rules.	
7		Logic and Classification Rules.	
8		Statement. Syllogism, Conclusions. Analysis of Arguments.	
9		Statement. Syllogism, Conclusions. Analysis of Arguments.	
10		Formal and Informal Logic.	
11		Formal and Informal Logic.	
12		Logical Fallacies, Ability to Ask the Right Questions.	
13		Logical Fallacies, Ability to Ask the Right Questions.	
14		Inductive and Deductive Logic.	
15		Inductive and Deductive Logic.	

Recommended Sources

TEXTBOOK(S)

- The Art of Reasoning, The Introduction to Logic and Critical Thinking, 4th edition, David Kelley, 2014
- Thinking Fast and Slow, Daniel Kahneman, 2013
- Logic Primer - 2nd Edition, by [Colin Allen](#), [Michael Hand](#)
- Logic. An Introduction to Elementary Logic - 2nd Edition, by [Colin Allen](#), [Michael Hand](#)
- Philosophy of Logic, 1986, by [W. V. Quine](#)
- The Tractatus Logico-Philosophicus, Wittgenstein, 1921
- Sense and Reference, Gottlob Frege, 1892

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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			3

MODULE HANDBOOK

Ecology bachelor program, Department of “Philosophy”.

Course Unit Title	Ethics and aesthetics
Course Unit Code	ÜFS-B01
Type of Course Unit	Selection
Level of Course Unit	2
National Credits	
Number of ECTS Credits Allocated	3
Theoretical (hour/week)	0.5
Practice (hour/week)	0.5
Laboratory (hour/week)	
Year of Study	
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	
Prerequisites	-

Recommended Optional Program Components		-
Course description: The subject "Ethics" examines the emergence and evolution of ethical teachings throughout history; it allows students to gain knowledge about the main ethical theories that have existed in human history, to form a unified view of the study of ethics in the system of social and philosophical sciences, and to understand the process of interaction between morality and society.		
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. 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.		
At the end of the course the student will be able to		Assessment
1	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.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing	

	information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		Ethics in the system of philosophical knowledge.	
2		Formation of ethical thought. Main stages in the development of ethical teachings.	
3		Ethical ideas in the history of public thought of Azerbaijan.	
4		The essence and functions of morality.	
5		Moral feeling and moral practice.	
6		Applied ethics and its scope.	
7		Ethical principles in professional activity.	
<p>Recommended Sources TEXTBOOK(S)</p> <ul style="list-style-type: none"> – Qizilgul Abbasova. Ethics: history, theory and practice (textbook). Baku, 2016. – Sevinj Shahhüseynova, Ethics, Baku, 2009. – Aristotle, Politics. Great Ethics, Baku, 2006. – Nasiruddin Tusi, Moral Nasiri, Baku, 1989. 			
Assessment			
Attendance	10%	At least 75% class attendance is compulsory	
Presentation	10%		
Quiz	0%		
Seminars	30%		
Midterm Exam	0%		
Final Exam	50%		
Total	100%		
Assessment Criteria			
Final grades are determined according to the Academic Regulations of WCU			
Course Policies			
<ul style="list-style-type: none"> • 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	240		
Total Workload/30(h)	240/30		
ECTS Credit of the Course	3		

MODULE HANDBOOK

Ecology bachelor program, Department of “Information Technologies”.

Course Unit Title	Information technologies		
Course Unit Code	ÜFS-B01		
Type of Course Unit	Selection		
Level of Course Unit	4		
National Credits			
Number of ECTS Credits Allocated	3		
Theoretical (hour/week)	0.5		
Practice (hour/week)	0.5		
Laboratory (hour/week)			
Year of Study			
Semester when the course unit is delivered	7		
Course Coordinator	Rana Hajiyeva		
Name of Lecturer (s)	Rana Hajiyeva		
Name of Assistant (s)	-		
Mode of Delivery	Face to face		
Language of Instruction	Azerbaijani		
Prerequisites	-		
Recommended Optional Program Components	-		
Course description: To form appropriate knowledge, skills and habits in students, and to ensure their preparation for working with computers.			
Objectives of the Course: Ensuring the scientific and methodological preparation of future specialists (goals and content of Informatics training, forms of organization of training, methods and tools, modern training technologies), forming in them the relevant knowledge, skills and habits for implementing training, familiarizing them with the accumulated experience in teaching Informatics, and forming the ability to think logically.			
Learning Outcomes			
At the end of the course the student will be able to			Assessment
1	Formation of ideas about the goals and objectives of informatics as a science, scientific research methods, and its relationship with other sciences; Formation of ideas about the forms of organizing informatics training;		
2	Formation of ideas about the means of computer science training; Formation of ideas about the principles and training methods of computer science		

	training;		
3	Formation of ideas about the goals and objectives of Informatics training for undergraduate students.		
4	Implementation of practical tasks used in the training of Informatics course for undergraduate students.		
5	Monitoring and investigating the level of implementation of practical tasks.		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
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		Computer architecture. Assembling and disassembling a computer. Visual familiarization with devices.	
3		The main components of information technologies. HardWare -	

		technical support. SoftWare - software. BrainWare - instrumental support. Main and peripheral devices of computers.	
4		Practical ways to use the basic capabilities of the Word text editor. Formatting texts. Creating tables.	
5		Computer software. Classification of operating systems. Windows operating system.	
Recommended Sources TEXTBOOK(S) <ul style="list-style-type: none"> – Alizade M.N., Orujova T.V., Hasanova N.A. Information security. Baku, "MSV Publishing House", 2018, 388 pages. – Hajiyeva R.C. Informatics. Collection of lectures, Polygr. and Publishing Center of KKU, Baku, 2020, 180 p. – Abasov B. Microsoft Access database management system. Baku, 2009. – Shirokova A. I., Pyshniak M. Informatics. Разработка программ на языке программирования Python, М., 2020, 144 p. – Informatics for economists. Учебник для бакалавриата и специалитета / ed. Poliakov V. P. М.: Yurayt, 2019. 524 с. – Lyakhovich V.F., Molodtsov V.A., Ryzhikova N.B. Fundamentals of computer science. — М.: KnoRus, 2016. — 348 с. – Makarova N. B. Informatics: Textbook for universities. Publisher: Peter, 2013, 576 с. – Informatics and information technologies / ed. Yu.D. Romanova. — М.: Eksmo, 2011. — 544 p. – Prosvetov G.I. Data analysis using Excel. Tasks and solutions. — М.: Alfa-Press, 2015. — 160 с – Nabiullina S.N. Informatics and ICT. Course lecture. М.: Lan, 2019. 72 p. – Gasumova S. E. Social informatics. Textbook and practice for universities. М.: Yurayt, 2019. 284 с. – "Informatics for economists". Textbook. Under the editorship. prof. V. M. Matyushka. М., INFRA-M, 2006. – Evdokimov V.V. Economic informatics, textbook for universities, St. Petersburg: Peter, 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			
<ul style="list-style-type: none"> • 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	240		
Total Workload/30(h)	240/30		
ECTS Credit of the Course	3		

MODULE HANDBOOK

Ecology bachelor program, Department of "Information Technologies".

Course Unit Title	Information management and database creation.		
Course Unit Code	ÜFS-B02		
Type of Course Unit	Selection		
Level of Course Unit	2 nd year		
National Credits			
Number of ECTS Credits Allocated	3		
Theoretical (hour/week)	0.5		
Practice (hour/week)	0.5		
Laboratory (hour/week)			
Year of Study			
Semester when the course unit is delivered	4		
Course Coordinator	Esmira Ahmadova		
Name of Lecturer (s)	Esmira Ahmadova		
Name of Assistant (s)	-		
Mode of Delivery	Face to face		
Language of Instruction	Azerbaijani		
Prerequisites	-		
Recommended Optional Program Components	-		
Course description: The subject "Information Management and Database Creation" 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 and Database Creation" 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; Formation of ideas about information technologies and their areas of application.		
2	Formation of concepts about information management; Formation of concepts about database management system and database creation.		
3	Formation of ideas about spreadsheet organization technologies.		

4	Formation of ideas about computer networks and the ability to use them.		
5	Formation of the ability to use information technologies that are most commonly used in education and in the specialty.		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		Information and information processes. Information management.	
2		Information technologies and their application areas.	
3		Database management system.	
4		Database organization in MS Access environment.	
5		Spreadsheet organization technologies.	
6		Using information resources and services in the Internet environment.	
7		Geographic information systems.	
8		Using other application programs.	
Recommended Sources			

TEXTBOOK(S)			
<ul style="list-style-type: none"> – Hajiyeva R.C. Informatics. Collection of lectures, Polygr. and Publishing Center of KGU, Baku, 2020, 180 p. – Karimov S.G., Habibullayev S.B., Ibrahimzade T.I. Informatics. Baku, 2011. Textbook for academic bachelor's degree. In 2 volumes. Volume 2. M.: Jurayt, 2019. 406 c. – Filimonova E. B. Informatics and information technologies in professional activity. Textbook. M.: Justitia, 2019. 216 c. – Kaimin V.A. Informatics. - M.: ИИФРА-М, 2012. – Databases and database management system Access. – http://tpt.tom.ru/sved/umk/obscheobraz/uchebnik/dbase.htm – What is data management? – https://www.oracle.com/cis/database/what-is-data-management/ – Khalilov M.S., Hasanova N.A. Informatics. Baku University Press, 2014, 404 p. – Kaimin V.A. Informatics. - M.: ИИФРА-М, 2012. – Technologies in rural economy: types and applications. – https://eos.com/ru/blog/novye-tehnologii-v-selskom-khozyajstve/ 			
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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			3

MODULE HANDBOOK**Ecology bachelor program, Department of "Information Technologies".**

Course Unit Title	Entrepreneurship basics and introduction to business	
Course Unit Code	ÜFS-B01	
Type of Course Unit	Selection	
Level of Course Unit	2	
National Credits		
Number of ECTS Credits Allocated	7	
Theoretical (hour/week)	0.5	
Practice (hour/week)	0.5	
Laboratory (hour/week)		
Year of Study	2	
Semester when the course unit is delivered	1	
Course Coordinator		
Name of Lecturer (s)		
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	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:		
Objective: 1: Understand the entrepreneurial process, its impact, and significance within the macro and micro context of individuals, economies and societies. Objective 2: .Understand and apply the entrepreneurial mindset to discover business ideas and assess their viability Objective 3: Analyse the key components of the entrepreneurial process, namely; opportunity discovery, business modelling, procurement resources and team formation. Objective 4: 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	Course structure, purpose and expectations	
2	Understanding of the role of entrepreneurship in driving innovation and economic development.	
3	Exploring examples of successful entrepreneurs and their impact on society	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		

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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		Introduction To Entrepreneurship	
2		Entrepreneurial & Start Up Culture	
3		Startup Thinking	
4		Problem Definition	
5		Empathy And Observation	
6		Innovation And Creativity	
7		Empathy And Observation	
8		Problem	
Recommended Sources			
TEXTBOOK(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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			3

MODULE HANDBOOK

Ecology bachelor program, Department of “Psixologiya və Sosial iş”.

Course Unit Title	Political science
Course Unit Code	ÜFS-B02
Type of Course Unit	Mandatory
Level of Course Unit	2
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	0.5
Practice (hour/week)	0.5
Laboratory (hour/week)	
Year of Study	2
Semester when the course unit is delivered	4

Course Coordinator	Elkhan Rahimov	
Name of Lecturer (s)	Elkhan Rahimov	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction		
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
<p>"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.</p>		
Objectives of the Course:		
<ul style="list-style-type: none"> - The main goal of the course is to help students develop a general understanding of contemporary political knowledge. - The main teaching methods are lectures, exercises, demonstrations, class discussions, expert reports, team projects, role-playing games, analysis and criticism of various political works, including articles 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 basic concepts of politics at the end of the course.	
2	The ability to analyze empirical and normative approaches will be developed.	
3	Familiarity with various political teachings will help them form a broad and systematic political worldview.	
4	The formation of ideas about the goals and objectives of the discipline of political science, scientific research methods, and its relationship with other sciences explains to students the relationship of this discipline with other sciences.	
5	Distinguishes the dynamics of the emergence and development of political science, determines and applies the form appropriate to the topic.	
6	Interprets the goals and objectives of political science teaching.	
7	Forms the ability to freely think about the theories taught in political science teaching and to make predictions about the events taking place in the international world.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Knowledge about politics. Stages of development of political science.	
2		Concept of State – Definition of State – Social Contract – Role and Power of the State	
3		Political ideologies Political power	
4		Democracy: Concept of Democracy. Forms of Democracy	
5		The foreign policy The understanding of foreign policy Foreign policy functions	
6		International Relations • What is International Relations? • Theories of International Relations Main Stages in the Development of International Relations Theory	
7		Global Governance • What is Globalization? • What is Global Governance? Global Media and the Public Dilemma	
8		Game Theory Political Conflict and Security	

Recommended Sources

TEXTBOOK(S)

<ul style="list-style-type: none"> – Afandiyav, M. (1998) Problems of Political Science. Baku. – Huseynov, R. (2017) Political Science. Baku. – Shiraliyev H., Ahmadov A. (1997) Political Science. Baku. – Shiraliyev H. (1998) Political Science. Baku. – Teymurlu, M. (2014) Political Science. Baku. – Azerbaijan State University of Economics (2004) Political Science (Textbook). Baku. – Vasilik M. A. (ed.) (2001). Political Science. Moscow: Gardariki. – Pugachev V.P., Soloviev, A.I. (1998). Introduction to Political Science. Moscow: Aspect Press. – Heywood, A (2013). Politics. 4th ed. New York: Palgrave Macmillan. – 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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			3

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and Environment”.

Course Unit Title	Environmental chemistry
Course Unit Code	İF-B18
Type of Course Unit	Mandatory
Level of Course Unit	2

National Credits		
Number of ECTS Credits Allocated		6
Theoretical (hour/week)		1
Practice (hour/week)		0.5
Laboratory (hour/week)		0.5
Year of Study		
Semester when the course unit is delivered		3
Course Coordinator		Narmina Abdullayeva
Name of Lecturer (s)		Narmina Abdullayeva
Name of Assistant (s)		-
Mode of Delivery		Face to face
Language of Instruction		Azerbaijani, English, Russian
Prerequisites		-
Recommended Optional Program Components		-
Course description:		
<p>The main task of the course is the study of chemical processes occurring in the environment, including human activity (farming, industry, military, etc.), directly and indirectly affecting people and chemical processes occurring in the geosphere (atmosphere, hydrosphere and lithosphere). The subject "Environmental Chemistry" is closely related to general and inorganic chemistry, organic chemistry, petrochemistry, etc. disciplines. The application of new technologies, the impact of chemicals on the environment and the formation of methods for monitoring its condition.</p>		
Objectives of the Course:		
<p>Ekoloji kimya ” fənnin tədrisində əsas məqsəd aşağıda qeyd olunan izahların verilməsidir:</p> <ul style="list-style-type: none"> - providing a broad explanation of the causes of anthropogenic environmental problems; - providing information on environmental problems arising in the lithosphere, hydrosphere, atmosphere and biosphere; - providing an explanation of environmental problems arising from the use of chemical agents; - information on various production industries of chemistry and other industries; - explanations on environmental problems arising from food contamination arising from the use of chemical agents and their elimination; - information on the analysis of pollutants 		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	The subject "Ecological Chemistry" is closely related to the complexes of technical sciences, which are important for studying. It is impossible to study and understand this course without knowledge in the fields of chemistry, biology, physics, mechanics. All this is important for in-depth study of the knowledge characteristic of natural, mathematical and technical sciences.	
2	-students evaluate chemical pollution of the environment and soil. -students evaluate the characteristics of the impact of major pollutants on the environment and soil.	
3	the characteristics of the impact of various areas of human economic activity on the environment, -the main standards of environmental quality,	
4	determines the impact of chemical pollution on human health, -studies the main ways of implementing environmental protection activities, -uses qualitative and quantitative indicators to assess anthropogenic impact on the	

	environment.		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		Environmental problems of the chemical industry, their causes.	
2		Environmental problems caused by chemical industry waste in the environment.	
3		Ways to solve environmental problems caused by chemical industry products.	
4		Environmental problems caused by mineral acids production.	
5		Environmental problems caused by pesticides in the environment.	
6		Sources of soil pollution, its ecological danger and prevention.	
7		Environmental problems caused by solid chemical industry waste in the soil	
8		Environmental problems caused by the application of mineral fertilizers.	

9		Sources of raw materials used in the production of mineral fertilizers.	
10		Pollution of the environment with harmful substances in the production of phosphorus fertilizers.	
11		Environmental problems caused by the use of nitrogen fertilizers.	
12		Information on the pollution of the soil of the Absheron Peninsula with oil and oil products and their ecological danger.	
13		Agricultural problems, their causes.	
14		Environmental problems caused by the use of nitrogen fertilizers.	
15		Methods of wastewater treatment of agro-complexes.	
16		Environmental problems caused by the treatment of biogenically polluted waters.	
17		Problems caused by climate change in agriculture.	
<p>Recommended Sources</p> <p>TEXTBOOK(S)</p> <ul style="list-style-type: none"> – R.A.Aliyeva, S.R.Hajiyeva, A.G.Huseynli, P.R.Mammadov, H.Ibadov, G.I.Bayramov. Environmental Chemistry, UniPrint, Baku, 2013, 280 p. – Alimov A. M., Akhmetov T. M., Volkov A. Kh., Kasanova N. R. Ecological Chemistry. Textbook. Lan, St. Petersburg, 2023, 144 p. – Ivankin A. N. Ecochemistry. Textbook. Lan, St. Petersburg, 2023, 108 p. – Melitovskaya I. N. Ecological Chemistry. Practical Work. Textbook. Lan, St. Petersburg, 2023, 44 p. – Egorov V. V. Ecological Chemistry. Textbook. Lan, St. Petersburg, 2022, 184 p. – Motuzova G. V., Karpova E. A. Short Course in Ecological Chemistry. Textbook. M.: World of Science, 2020. 258 p. – Jorge G. Ibanez, Margarita Hernandez-Esparza, Carmen Doria-Serrano, Arturo Fregoso-Infante. Environmental Chemistry. Yale University. Springer, 2007, 334 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			
<ul style="list-style-type: none"> • 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	240		
Total Workload/30(h)	240/30		
ECTS Credit of the Course	6		

MODULE HANDBOOK

Ecology bachelor program, Department of "Natural Science".

Course Unit Title	Biology	
Course Unit Code	IF-B02	
Type of Course Unit	Mandatory	
Level of Course Unit	1	
National Credits		
Number of ECTS Credits Allocated	6	
Theoretical (hour/week)	1	
Practice (hour/week)	0.6	
Laboratory (hour/week)	0.3	
Year of Study		
Semester when the course unit is delivered	1	
Course Coordinator	Reyhan Abdullayeva	
Name of Lecturer (s)	Reyhan Abdullayeva	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani	
Prerequisites	-	
Recommended Optional Program Components	-	
Course Description: Biology - covers the basic biological principles and concepts, studies living beings and life processes at different levels of structure, laws specific to species and common to all organisms. General biology is a complex and comprehensive subject and consists of several departments, such as cytology, biochemistry, genetics, evolutionary learning, ecology, biosphere learning.		
Objectives of the Course:		
<ul style="list-style-type: none"> - To study the laws of operation of biological systems at the molecular, cellular, organismic, population, biogeocenotic and biosphere levels. - General characteristics of living things: variability, heredity, metabolism, etc. - Analyze the interaction of biological systems at different levels of life. - To study the mechanisms of interaction of living things with the environment. 		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	The main characteristics and levels of the structure of living organisms and the chemical composition of living organisms.	
2	Structure, functions, molecular composition, division, life cycle and types of metabolism of prokaryotic and eukaryotic cells.	

3	Paths of energy and metabolic processes in plant and animal cells. Photosynthesis.		
4	Organic composition of the organism, protein synthesis processes.		
5	Reproduction and development of organisms. Ontogenesis and phylogenesis		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Wee k	Chapter	Topics	Exam
1		The subject of biology, its relationship with other sciences. The main characteristics of living organisms. Cell theory.	
2		Cell morphology. Prokaryotic and eukaryotic cells. Different and similar characteristics of plant and animal cells.	
3		The structure and functions of cellular organelles.	
4		Inorganic and organic substances of the cell: carbohydrates, fats, proteins. Their structure, functions and importance in the life of the cell.	

5		Protein synthesis, transcription and translation. Nucleic acids, their types and functions.	
6		Life cycle of a cell. Mitosis, amitosis and meiosis.	
7		Cellular metabolism. Assimilation and dissimilation.	
8		Reproduction of living organisms: sexual, asexual and vegetative reproduction..	
9		The world of plants. Lower plants. Algae. Lichens. The role of primary plants in nature and their economic importance.	
10		Higher plants Department of Bryophytes. Department of Ferns.	
11		Department of gymnosperms and angiosperms. Characteristics and importance.	
12		Viruses, bacteria and fungi. Structure, vital activity, importance	
13		Structure and physiology of animals. Main organ systems. Nutrition, reproduction.	
14		Ontogenesis of animals.	
15		Biodiversity, its protection. Measures taken to protect biodiversity in Azerbaijan	
		Lab 1. Structure and use of the Microscope with Microscopic observation Application: Staining and observing onion epidermis or cheek epithelial cells under the microscope	
		Lab 2. Effect of temperature on enzyme activity. Application: observing the breakdown of hydrogen peroxide using catalase (from sources like liver or potato)	
		Lab 3. Evidence of Photosynthesis and the effect of light intensity Application: counting oxygen bubbles produced by Elodea (aquatic plant) under varying light conditions	
		Lab 4. Observation of osmosis and diffusion processes Application: placing potato slices in saltwater and distilled water to observe changes	
		Lab 5. Observation of blood cells and blood typing Application: using simulations or models to test for ABO blood groups	
<p>Recommended Sources TEXTBOOK(S)</p> <ul style="list-style-type: none"> – Najafov J.A., Aliyev R.A., Azizov A.P. Fundamentals of medical biology and genetics. Volumes 1 and 2. Baku – “Teacher”, 2010 – Gasimov E.K. Cytology: Textbook for higher schools. Baku: “Time Print”, 2013, 272 p. – F.Islamzadeh, A.Efendiyev, F.Islamzadeh Fundamentals of human biochemistry, Baku – “Teacher” publishing house – 2015 – Pillai R.K., Chaudhry A.K. Biology 2018. – Taylor D., Green N., Stout W.; Biology in 3 volumes (Translated from English), 2022, 1340 p. – Myandina G.I., Tarasenko E.V. Biology in pictures, diagrams and tables, 2023, 264 p. – G.L. Snigur, T.N. Shcherbakova, E.Yu. Sakharova, Fundamentals of human genetics. 			
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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			6

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Enviroment".

Course Unit Title	Higher mathematics
Course Unit Code	İF-BO3
Type of Course Unit	Mandatory
Level of Course Unit	1
National Credits	
Number of ECTS Credits Allocated	7
Theoretical (hour/week)	1.5
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	1
Course Coordinator	Fatma Amiraslanli
Name of Lecturer (s)	Fatma Amiraslanli
Name of Assistant (s)	-
Mode of Delivery	Face to face

Language of Instruction	Azerbaijani	
Prerequisites	-	
Recommended Optional Program Components	-	
<p>Course description: The higher mathematics course teaches topics in the sections of the subject "Mathematics": "Elements of Linear Algebra and Mathematical Analysis", "Differential and Integral Calculus of Univariate Functions", "Analytical Geometry", "Probability Theory", "Mathematical Statistics", and is intended to teach students the basic concepts of the subject and master basic knowledge. These, in turn, play an important role in teaching other subjects. The course consists of theoretical and seminar lessons. Here, the application of all theorems and properties is reflected in practical work.</p>		
<p>Objectives of the Course:</p> <p>To master the basics of the subject "Higher Mathematics" for specialists in the given directions in order to develop the skills of applying linear algebra and mathematical analysis elements in computing techniques, programming, and in the fields of economics.</p> <p>Providing scientific and methodological training for future specialists, forming in them the relevant knowledge, skills and habits for the implementation of education, the skills of applying mathematics and probability theory in various fields of economics, the formation of creative and independent thinking abilities.</p> <p>The purpose of the subject is to increase the level of fundamental mathematical preparation of students and instill in them the skills of applying the knowledge they have acquired to various fields of economics. During the teaching of the subject, students are taught the basic postulates of probability theory (classical, statistical and geometric definitions of probability). Information is provided about the compliance of the probabilities of occurrence of random events with various laws. The compliance of random quantities, which quantitatively express the considered random event, with the laws of distribution and the ways of their application to practical areas are investigated.</p> <p>During the teaching of the mathematical statistics section, methods of collecting, grouping, and evaluating statistical data are explored with students. Methods of evaluating the dependence of one random variable on other random variables (functional, statistical, correlation dependencies) are taught.</p>		
<p>Learning Outcomes</p>		
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.	
<p>Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz</p>		
<p>Course's Contribution to Program</p>		
		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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making	

	and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		The concept of matrix, operations on matrices. Two- and three-order determinants. Minor and algebraic complements.	
2		System of linear equations. Cramer's formulas.	
3		Rectangular and polar coordinate systems. Equations of a straight line on the plane.	
4		Curves of two-order on the plane.	
5		The concept of function. Classification of functions. Basic elementary functions.	
6		Limit of a sequence and a function, basic theorems. Outstanding limits. Infinitely increasing and infinitely decreasing functions.	
7		Continuity of a function at a point and on a segment, properties. Classification of points of intersection.	
8		Derivative of a function, geometric and mechanical meaning. Derivative table. Derivative of complex, inverse and implicit functions.	
9		Basic theorems of differential calculus. Application of the derivative. L'Hopital's rule. Theorems about the extrema of a function and their existence.	
10		The concept of elementary functions. Indefinite integral, properties. Table of integrals.	
11		Integration methods: substitution of a variable, integration by parts.	
12		Definite integral, properties and geometric meaning. Newton-Leibniz formula. Substitution of a variable in a definite integral and methods of integration by parts.	
13		Ordinary differential equations. First order differential equations. Separable differential equations.	
14		Basic concepts of probability theory. Various definitions of	

		probability. Theory of combinations and its applications.	
15		Sum, difference and product of events. Conditional probability, theorems of multiplication and addition of probability. Probability of at least one event occurring.	
16		Formula of complete probability. Bayes' formula. Independent tests. Bernoulli's formula. Most probable number.	
17		Random quantities. Law of distribution of discrete random quantities. Numerical characteristics of discrete random variables.	

Recommended Sources TEXTBOOK(S)

- Almammedov M.S, Mikayilov N.A. Lectures from the Higher Mathematics Course. Baku, 2007.
- Almammedov M.S. Lectures from Mathematical Analysis, Probability Theory and Mathematical Statistics. Baku, 2010
- Berman G.N. Collection of Problems on Mathematical Analysis. M., 1973.
- Aliyev A. Higher Mathematics. Baku, 2010.
- Garayev M., Guluzade T. Mathematics I, II, III. Problems, Programs and Test Examples. Baku, 2012.
- Piskunov N.S. "Differential and Integral Calculus". I, II, Part (Translated by R. Sultanov). Baku – 1966.
- Demidovich V.P., Kudryavtsev V.A. Short course of advanced mathematics. M.: "Nauka", 2001.
- Il'in V.A., Kurkina A.V. Higher mathematics M.: 2005.
- Il'in V.A., Pozniak E.G. Linear algebra. M.: "Nauka", 1981.
- Natanson I.P. Short course of advanced mathematics. Izd. 6, M.: 2003
- Piskunov N.S. Differential and integral calculus. T.I-II, M., 2005.
- Fichtengolts G.M. Course of differential and integral calculus. T.I-III.
- Beklemishev D.V. Course of analytical geometry and linear algebra. M., "High School", 1998.
- N. Sh. Kremer Higher mathematics for economic specialities. 3rd edition. 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

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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			7

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Biosphere and its protection		
Course Unit Code	İF-B04		
Type of Course Unit	Mandatory		
Level of Course Unit			
National Credits			
Number of ECTS Credits Allocated	6		
Theoretical (hour/week)	1.5		
Practice (hour/week)	1		
Laboratory (hour/week)			
Year of Study			
Semester when the course unit is delivered			
Course Coordinator	Sabiya Osmanova		
Name of Lecturer (s)	Sabiya Osmanova		
Name of Assistant (s)	-		
Mode of Delivery	Face to face		
Language of Instruction	Azerbaijani, russian,English		
Prerequisites	-		
Recommended Optional Program Components	-		
Course description:	The aim of the course "Biosphere and its Protection" is to provide information about the biosphere's place in the Earth's global ecosystem and among the Earth's layers, its evolution, sources of pollution of the atmosphere, hydrosphere, and lithosphere, and the reduction of these pollutants.		
Objectives of the Course:	By taking this course, students will become familiar with the processes occurring in the biosphere and its protection.		
Learning Outcomes			
At the end of the course the student will be able to			Assessment
1	Composition of the biosphere.		
2	The atmosphere as a component of the biosphere and its protection.		
3	The lithosphere, its structure and its protection.		
4	The hydrosphere, its resources and protection.		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Biosphere - the global ecosystem of the Earth. The place of the biosphere among the layers of the Earth.	
2		The evolution of the biosphere.	
3		The composition of the biosphere.	
4		The main functions of the biosphere and the processes occurring in the biosphere.	
5		The circulation of substances in the biosphere.	
6		Biogeochemical cycles of the most important biogenic substances. Oxygen and carbon cycles.	
7		Nitrogen, sulfur and phosphorus cycles.	
8		Biological regulation of the environment and factors of sustainability of the biosphere.	
9		The role of man in the biosphere.	
10		Modern stages of impact on the biosphere. The transformation of the biosphere into the noosphere.	
11		The atmosphere as a component of the biosphere and its ecological	

		role.	
12		Protection of the atmosphere. Characteristics of the atmosphere and types of pollution.	
13		Sources of natural and artificial pollution of the atmosphere.	
14		Hydrosphere - ecological role and significance.	
15		Protection of the hydrosphere. Characteristics of water resources and wastewater.	
16		The world ocean and its pollution.	
17		Lithosphere. Soil ecosystem, its structure.	
18		Ecological significance of soil.	
19		Functions of soil.	
20		Protection of the lithosphere.	
21		Structure and metabolism of the technosphere.	
22		Technosphere. Resource use and ecosystem degradation.	
23		Technogenesis and dynamics of the ecosphere.	
<p>Recommended Sources TEXTBOOK(S)</p> <ul style="list-style-type: none"> - Mammadov G., Khalilov M. Ecology, environment and man. Baku, 2006, 411 p. - Khaliov T. Basics of ecology and environmental protection. Baku, 2009, 232 pages. - V. Vernadsky. Chemical structure of the Earth's biosphere and its environment / M.: Book on demand, 2014, 348 p. - Peredelsky L.V., Korobkin V.I., Prikhodchenko O.E. Ecology, Moscow: Knorus", 2009. - 345 p. - Voronova G.A., Yurmazova T.A. Chemical elements in the biosphere: a tutorial / National Research Tomsk Polytechnic University. - Tomsk: Publishing House of Tomsk Polytechnic University, 2010. - 94 p. - Miroshnichenko Yu.Yu., Yurmazova T.A. Chemical pollution in the biosphere and its definition: a tutorial. - Tomsk: Publishing House of National Research Tomsk Polytechnic University, 2010. - 86 p. - Lebedeva M.I., Ankudimova I.A. Ecology: A tutorial. - Tambov: Publishing House of TSTU, 2002. - 80 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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			6

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Physics	
Course Unit Code	İF-B05	
Type of Course Unit	Mandatory	
Level of Course Unit	1	
National Credits		
Number of ECTS Credits Allocated	4	
Theoretical (hour/week)	0.5	
Practice (hour/week)		
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered	2	
Course Coordinator	Ilham Salimov	
Name of Lecturer (s)	Ilham Salimov	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani	
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 connection of physics to life and to be able to apply it to various fields.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	The main form of delivery of course material is lectures. An important aspect of lectures on physics is that real and computer-based physical experiments should be conducted, educational films, and model computer programs should be used.	

2	Important sections of the course program can be taken up in seminar classes. As a rule, seminars consider theoretical materials that require complex mathematical apparatus, and various methods of solving problems. Students can receive various types of homework to consolidate the materials received in seminars. They will practically comprehend the subject by performing laboratory work.		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		Vectors and operations on them. Vector and scalar quantities. System of units and measurement of physical quantities. Mechanical motion. Rectilinear motion of a material point and equations of motion. Acceleration, uniformly accelerating and uniformly decelerating motion. Curvilinear motion along a circle, characterizing quantities - acceleration, angular and linear velocity. Dynamics. Inertial calculation systems. Newton's I and II laws.	

2		<p>Concept of force and mass. Weight of an object, gravitational force. Weightlessness. Newton's -III law. Gravitational force. Law of universal gravitation. Gravitational constant Elastic forces. Hooke's law. Mechanical stress. Friction force, types, friction coefficient. Mechanical work. Power, units of measurement. Impulse. Energy. Kinetic and potential energy. Law of conservation of mechanical energy. Law of conservation of momentum.</p>	
3		<p>Molecular kinetic concept. Basic provisions of molecular kinetic theory and their experimental confirmation. Ideal gases. Isoprocesses. Equation of state of an ideal gas, graphs. Dance movement. Mathematical and spring dancers. Period of dance. Harmonic dances. Equations of harmonic dance. Mechanical waves and their types. Wavelength. Interference of waves.</p>	
4		<p>Steady flow of liquids. Continuity equation. Bernoulli's equation and its consequences. Viscosity of liquids and gases. Flow of liquids in pipes. Poiseuille's formula. Laminar and turbulent flow regimes. Reynolds number. Motion of solids in liquids and gases. Stokes' formula. Characteristics of the liquid state. Properties of the surface layer of liquids. Surface energy. Surface tension. Wetting phenomenon. Laplace's formula.</p>	
5		<p>Electrostatics. Electric charge, their mutual force. Coulomb's law. Electric field intensity. Intensity vector flux. Potential difference. Dielectrics. Dielectrics in an electric field. Polarization of dielectrics. Electric capacity, units. Capacitors. Energy of a capacitor, series and parallel connection.</p>	
6		<p>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, E.H.Q. Structure and properties of solids. Theory of zones. 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.</p>	
7		<p>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. Movement of charged particles in a magnetic field. Lorentz force. Magnetic flux. Electromagnetic induction phenomenon. Induction current. Self-induction phenomenon, inductance. Lenz's rule. Elements of geometric optics. Thin lens, Lenz's formula. Optical power of a lens. Diopter. Linear magnification of a lens.</p>	
8		<p>Structure of the atom. Thomson model of the atom. Rutherford experiment. Planetary model of the atom. Bohr theory. Bohr postulates, its shortcomings. Stationary states.</p>	
9		<p>Introduction to laboratory work. Understanding of errors. Determination of the acceleration of gravity using a mathematical dancer.</p>	

10		Coulomb potential and Coulomb field of metal surfaces, determination of the charge of a sphere. Calculation of the force of interaction between charged particles.	
11		Determination of capacitance in a capacitor, dielectric permittivity of the medium.	
		Lab 1. A simple pendulum (mathematical pendulum) is used to determine the acceleration of free fall (g).	
		Lab 2. Variation of capacitor capacitance for different dielectric media and finding relative dielectric permittivity.	
		Lab 3. Determination of the relationship between current strength and voltage in an electric circuit, calculation of internal resistance and electromotive force (EMF).	

Recommended Sources TEXTBOOK(S)

- Gojayev Niftali Mehrali oglu. General physics course. Volume IV (optics). [textbook for higher education institutions]. Baku 2011.540 p.
- R.M.Rzayev. Physics, [textbook for higher education institutions]. Baku 2015.736 p.
- Aliyev Bayram Zeynal oglu. General physics course. Baku, Elm, 2010, 294 p.
- Ahmadov Faig Abdulavvel oglu. General physics course. Textbook for higher education institutions. Baku, 2006, 348 p.
- B.D. Aliyev, Q.T. Hasanov. General physics course. Textbook for higher education institutions. Baku, 2004, 660 p.
- Gojayev E.M., Safarov N.Y. “Applied Physics” Baku “AzTU “2018, 393 p..
- Q.T.Hasanov, A.A.Aliyev. General Physics Course. . [Textbook for higher education institutions]. Baku 2015. 440 p.
- M.Murguzov, A.Alekperov, O.Hasanov. General Physics Course. [Textbook for higher education institutions]. Baku 2011-322 p.
- Eyvazov E.A, Farajov V.C, Gurbanov S.S “ Introduction to Semiconductor Physics” Baku “Chinar Çap ” 2007, 392 p.
- Eyvazov E.A “ Physics of Solids” Baku “ Education” 2003, 455 p.
- Hasanov I.S “ Plasma and Batch Technology” Baku “ Science” 2007, 171 p.
- A.S.Abdinov, I.S.Hasanov, T.Kh.Huseynov “Fundamentals of electronic devices and emission electronics” Baku 2011, 358 p.
- I.N. Salimov, Methodology for solving physics problems with computers, 2018, 182 p. Physics for Scientists and Engineers by Knight (2nd Edition), Pearson – Addison Wesley (2008)
- Sears and Zemansky’s University Physics by Young and Freedman (12th Edition), Pearson – Addison Wesley (2008)
- Physics for Scientists & Engineers by Giancoli (4th Edition), Pearson – Prentice Hall (2009)
- Physics for Scientists and Engineers by Jewett and Serway (8th Edition), Brooks / Cole Cengage Learning (2010)
- University Physics by Bauer and Westfall, McGraw – Hill (2011)
- Michael M. Mansfield, Colm O’Sullivan, “Understanding Physics”, 3rd Edition Publisher: Wiley 2020. 656 Pages
- Alessio Mangoni “Fundamentals of physics” Publisher:AlessioMangoni. 2020, 284 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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			4

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Fundamentals of Earth Sciences
Course Unit Code	İF-BO6
Type of Course Unit	Mandatory
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Aruz Mikayilov
Name of Lecturer (s)	Aruz Mikayilov
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-

Recommended Optional Program Components		-
<p>We would not be wrong if we say that the main reason that prompted us to study the subject of fundamentals of earth sciences is the scientifically based complex approach to the environmental problems that have been occurring in the world since the middle of the 20th and early 21st centuries. Thus, the main reason for the extreme urgency of environmental problems in the modern era has been the recent intensification of human activity in the exploitation of natural resources in the world. Accordingly, the modern level of development of science and technology requires new approaches to the study of earth sciences, both in terms of content and teaching methods. World experience shows that many natural phenomena are better understood, mastered and remembered when natural sciences are studied in a comprehensive manner. Taking this into account, we will try to follow this principle within the course.</p>		
Objectives of the Course:		
<p>The fundamentals of Earth sciences consist of forming theoretical and practical ideas about the various scientific fields, their main object of research, as well as the spheres that make up the Earth, their formation and interaction with each other, natural components, the regularities of their zonal and azonal distribution, and their geographical and ecological significance.</p>		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Formation of students' ideas about the goals and objectives of the subject, its relationship with other sciences.	
2	Formation of ideas about the spheres of the Earth, their origin and modern state, and their significance.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	

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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Earth sciences and the issues facing it. Hypotheses about the universe, the solar system and its formation.	
2		General morphology and dimensions of the Earth. History of planetary development.	
3		History of geological development of the Earth. Internal structure. Rocks and minerals.	
4		Lithosphere. Relief of the Earth's crust. Morphogenetic processes.	
5		Mountains and plains, their formation and classification. Morphostructure and morphosculpture relief forms.	
6		Earth's movements and their geographical consequences.	
7		Earth's atmospheric layer. Composition and structure.	
8		Solar radiation and heat.	
9		Earth's baric field and troposphere air circulation.	
10		Earth's moisture cycle and water balance.	
11		Hydrosphere. General characteristics of the World Ocean.	
12		Waters of the land, their classification.	
13		Biosphere. Landscape layer of the Earth.	
14		Classification and characteristics of the Earth's climates.	
15		Geographic layer. Land cover of the Earth's surface.	

Recommended Sources

TEXTBOOK(S)

- Eminov Z.N. Geography. Baku-2004.
- Habibov T. General and historical geology. Baku-2015.
- Imanov F.A., Mammadov V.A., Abdullayev I.M. Hydrology. Baku-2014.
- Kazimov S.M., Safarov A.V., Yaghiyev I.I., Abasov M.M. General hydrogeology. Baku-2008.
- Mammadov G.Sh. Fundamentals of soil science and soil geography. Baku-2007.
- Mammadov G.Sh., Khalilov M.Y. Ecology, environment and man. Baku-2006.
- Museyibov M. A., Budagov B. A., Shirinov N. Sh. General geomorphology. Baku-2009.
- Safarov H.S. General meteorology. Baku-2014.
- Suleymanov M.A., Aliyeva I.S. Fundamentals of landscape science. Baku-2008.
- Shubayev L.P. General geography. Baku-1986.
- Bobkov V.A., Seliverstov Yu.P. Geoscience. Moscow-2004.
- Bokov, V.A. General Geoscience: textbook. Moscow-1998.
- Krepscha N.V. Earth Sciences: Textbook. Tomsk-2004.
- Roy Yu.F. General Geoscience. Brest-2018.
- Savtsova T.M. General Geoscience. Moscow-2003.
- Savtsova T.M. General Geoscience. Moscow-2005.
- Seliverstov Yu.P. Geoscience. Moscow-2004.
- Sladkopevtsev S.A. Geoscience and Nature Management. Moscow-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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			6

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	General ecology
Course Unit Code	İF-BO7
Type of Course Unit	Mandatory
Level of Course Unit	1
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	1
Practice (hour/week)	0.5
Laboratory (hour/week)	
Year of Study	

Semester when the course unit is delivered	2	
Course Coordinator	Kh. Hasanov	
Name of Lecturer (s)	Kh.Hasanov	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description: The subject of "General Ecology" studies environmental factors and their effects on the body, environmental pollution and protection, and modern environmental problems. In addition, environmental pollution, solid, liquid, and gaseous substances released into the environment, types of energy (heat, noise, radioactivity), and their direct or indirect negative effects on humans, animals, plants, and industrial facilities are shown.		
Objectives of the Course:		
The main goal of the subject is to study the laws and principles of the interaction of biotic and abiotic components of the ecosystem. Here, the fundamentals of "General Ecology" are studied - ecological factors, their classification and characteristics, the structure and components, functions and development of ecosystems, including forests. Sources of environmental pollution, methods of combating them, measures for neutralizing pollutants are studied. The structure and characteristics of various spheres (atmosphere, lithosphere and hydrosphere), main pollutants and sources of pollution are studied. Ecological problems of the Caspian Sea and measures for its protection are studied. Knowledge is gained about global ecological problems, their causes and ways of elimination, and specially protected natural areas.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Formation of ideas about the history of the development of ecological science, the subject and tasks of the science of "General Ecology".	
2	Formation of ideas about the interaction of ecological factors on organisms and vice versa, about the influence of organisms on the environment.	
3	Formation of ideas about global environmental problems.	
4	Formation of ideas about the modern ecological state of natural environments: air, water and soil.	
5	Formation of ideas about specially protected natural areas, the main directions of international cooperation in the field of environmental protection.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making	

	and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		The main purpose, importance and history of development of ecology.	
2		Scientific teaching about the biosphere and its evolution.	
3		Ecological factors.	
4		The concept of population. Population structure, density and biomass.	
5		Anthropogenic pollution of the environment and its protection.	
6		Artificial biocenosis or agro-biocenosis ecosystem.	
7		Agricultural production and maintenance of ecological balance.	
8		Protection of the atmosphere.	
9		Ecosystem of the hydrosphere layer.	
10		Ecosystem of the lithosphere layer.	
11		Ecology of the plant world, importance, composition, distribution features.	
12		Distribution, species diversity and protection of the animal world.	
13		Ecosystem of the seas and oceans.	
14		Pollution and protection of water.	
15		Ecological problems of the Caspian Sea.	
16		The relationship of the subject of "Ecology" with other sciences and the history of development.	
17		Ecological factors. Pollution of the natural environment.	
18		Measures to combat pollution of the atmosphere and lithosphere.	
19		Mineral fertilizer production and environmental protection.	
20		Structure, composition and pollution of the hydrosphere.	
21		Biodiversity and its role in the stability of the biosphere.	
22		Sources of pollution of the oceans and seas. The role of oil and oil products in the pollution of the World Ocean.	

23	Wastewater treatment.		
Recommended Sources			
TEXTBOOK(S)			
<ul style="list-style-type: none"> – Mammadov T.S. - Ecology, 2004. – Mammadov G.S., Khalilov M. - Ecology and environment, Baku, 2004. – Environmental legislation of the Republic of Azerbaijan (a collection of normative-legal acts). Baku: Qanun, 2006, 840 p. – Vlasov P. P., Orlova M. V., Tarasenkov N. V. Brief course in ecology: textbook. SPb.: SPbGUTD, 2010. 134 p. – Zubrilov S. P., Ishchuk Yu. G., Kosovsky V. I. Environmental protection during ship operation. L.: Shipbuilding. 2009. 256 p. – Kasymov A. G., Askerov F. S. Biodiversity: Oil and biological resources of the Caspian Sea. Baku, 2011. 326 p. – Korobkin, V. I., Peredelsky L. V. Ecology: [textbook for students of higher education institutions]. Rostov-on-Don: Phoenix, 2011. 602 p. – Mavrishchev V. V. Fundamentals of ecology: textbook. Minsk: Higher. School, 2017, 447 p. – Nikolaikin N. I., Nikolaikina N. E., Melekhova O. P. Ecology: Textbook. for universities. M.: Bustard, 2014. 624 p. – Odum Yu. Ecology. M., 2016, vol. 1, 325 p., vol. 2, 373 p. – Sidorchenko V.F., Kirilenko V.P. Shipping and preventing pollution of the world's oceans. M., 2010, 385 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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and Environment”.

Course Unit Title	Geographical Ecology	
Course Unit Code	İF-BO8	
Type of Course Unit	Mandatory	
Level of Course Unit	1	
National Credits		
Number of ECTS Credits Allocated	4	
Theoretical (hour/week)	1	
Practice (hour/week)	0.5	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered	4	
Course Coordinator	Aruz Mikayilov	
Name of Lecturer (s)	Aruz Mikayilov	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description: Since ecology is interdisciplinary in nature, its most important and synthetic field is geographical ecology. This subject deals with the internal and intersystemic relationships of nature-population-production systems and their territorial associations. During the teaching of the subject, the geographical approach plays a special role in the study of ecological problems arising from the interaction of society and nature.		
Objectives of the Course: The main goal of teaching the subject of geographical ecology is to study the nature of the Earth, its diversity as a whole and in parts. In addition, the main goals are to describe the ecological essence of the environment on Earth, to explain the regularity of ecological processes in that area, as well as to interpret the impact and consequences of the relationships between land, atmosphere, and ocean waters on ecological processes.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Formation of students' ideas about the goals and objectives of the subject, its relationship with other sciences; Formation of ideas about teaching aims; Formation of ideas about the causes and modern consequences of environmental problems in geographical spheres;	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Research object, subject and objectives of the course "Geographic Ecology"	
2		Ecogeographical foundations of natural and social processes.	
3		Ecological and geographical essence of the environment	
4		Cycle of substances in nature	
5		Natural zones, their components and classification	
6		Place of the landscape in the biosphere and ecological characteristics	
7		Geographical layer	
8		General information about the layers of the lithosphere	
9		Natural disasters of lithosphere origin and their ecological consequences	
10		Importance of soil ecology	
11		Pollution and protection of soils	
12		Geographical distribution and ecological characteristics of soils	
13		Ecology and protection of the hydrosphere	
14		Concept of the hydrosphere, ecological significance of the hydrosphere	
15		Ecology and protection of the atmosphere	

Recommended Sources			
TEXTBOOK(S)			
<ul style="list-style-type: none"> - Mammadov Garib, Khalilov Mahmud "Ecology and environmental protection" Baku, 2005. - Mammodov G.Sh., Khalilov M.Y., Mammadova S.Z. Agroecology Baku, "Elm" publishing house - 2010, 552 p. - Mammadov G.Sh., A.J. Hashimov, A.A. Verdiyev, E.A. Mammadova. Fundamentals of engineering geology "Elm" publishing house 2012. - Aliyeva R., Ch.Mustafayev , S.Hajiyeva - Fundamentals of ecology. B., 2010. 40 6 p. - Sadikhova N, Sultanov R, Atosova - General ecology. B., 2010. 400 p. - Mammadov G., M.Khalilov – Encyclopedic ecology. dictionary. B., 2008 - Mammadov G.Sh., Khalilov M.Y. "Ecology, environment and man". Baku, "Elm" publishing house - 2006, 608 p. - Khalilov T.A., "Fundamentals of ecology and environmental protection", Baku, "MBM-R", 2009, 232 p. - Sh. Goychayli "Problems of geography and geographical ecology" Baku, 2004 - Mammadov Garib, Khalilov Mahmud "Ecology and environmental protection" Baku, 2005. - Mammadov G.Sh., Khalilov M.Y., Mammadova S.Z. Agroecology Baku, "Elm" publishing house - 2010, 552 p. - Mammadov G.Sh., A.J. Hashimov, A.A. Verdiyev, E.A. Mammadova. Fundamentals of engineering geology, "Elm" publishing house, 2012. - Aliyeva R., Ch. Mustafayev, S. Hajiyeva - Fundamentals of ecology. B., 2010. 40 6 p. - Sadikhova N, Sultanov R, Atosova - General ecology. B., 2010. 400 p. - Mammadov G., M. Khalilov - Encyclopedic ecology. Dictionary. B., 2008. - Mammadov G.Sh., Khalilov M.Y. "Ecology, environment and man". Baku, "Elm" publishing house – 2006, 608 p. - Khalilov T.A., "Fundamentals of ecology and environmental protection", Baku, "MBM-R", 2009, 232 p. - Sgerov, Fagan Aliyev, Eldar Huseynov, Soltan Aliyev "Modern Ecology" Baku, 2007. - Baherchi T., V. Mehdiyeva. Economic and ecological assessment of the natural conditions and natural resources of the Republic of Azerbaijan. Baku.- 2012.- 304 p. - Golubev G.N. - Geoecology M. 1999. - Ecological alternative. M., 1990. 17-42 p. - Human ecology. M., 2001. 22-39 p.; 263-294 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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			4

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Ecology and environment
Course Unit Code	İF-B09
Type of Course Unit	Mandatory
Level of Course Unit	2 nd year
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	4
Course Coordinator	Arzu Mustafayev
Name of Lecturer (s)	Arzu Mustafayev
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-
Course description: Brief information about the subject, related subjects (directly related/compatible), objectives of teaching the subject. It states what students will know, what they will achieve, and what skills they will acquire by studying this subject.	
Objectives of the Course: To define the essence of animal ecology by showing the interaction between organisms and the environment, the regularities of the interaction of populations of individual species with the environment. To show the relationship of the science of animal ecology with morphology and systematics, bio- and zoogeography. To consider areas, their types and relic areas.	
Learning Outcomes	
At the end of the course the student will be able to	
1	To create a deeper understanding of the concept of fauna in students, adaptation to various environments, including extreme conditions, the characteristics of the fauna of Azerbaijan and animal ecology. To familiarize students with the Red Book of the republic and the principles of including
	Assessment

	animal species in the Red Book.		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Wee k	Chapter	Topics	Exam
1		Goals and objectives of the subject, its relationship with other subjects. Main habitats.	
2		Terrestrial-aerial habitat. Heat exchange in poikilothermic and homoiothermal animals.	
3		Edaphosphere and its physicochemical properties. Adaptive mechanisms of animals.	
4		Aquatic habitat. Adaptation of hydrobionts to the aquatic environment.	
5		Distribution of organisms in space, territorial groupings. Concept of territory.	
6		Biological rhythms. Mechanisms of daily, seasonal and annual	

		cycles.	
7		Photoperiodism and regulation of seasonal rhythms.	
8		Ethological structure of the population, signaling and training.	
9		Age composition of the population. Morphophysiological differences of different age groups in populations.	
10		Sex structure of the population. Sex ratio.	
11		Communities or biocenoses; interspecific relationships.	
12		Trophic relationships of hydrobionts.	
13		Animal world of the Caspian Sea.	
14		Protection of biotic communities.	
15		Protection of animals in the republic. Red Books.	

Recommended

Sources TEXTBOOK(S)

- G.T.Mustafayev., F.Z.Garabeyli., N.A.Maharromova “Ecology of Vertebrates” Baku-2001.
- D.N.Kashkarov. Fundamentals of animal ecology. M. Higher. school, Leningrad, 1944.
- E.McFedyen. Animal ecology. Mir Publishing House, M, 1965.
- G.Nikolsky. Fish ecology. M., Higher school, 1974
- R.Dazho. Fundamentals of ecology. M., progress, 1975
- Jafarova S.K. Ecology of poiklothermic animals. Baku, 2015
- V.A. Dogel. Invertebrate zoology. M.: 1981
- Yu.Odum Ecology. V.1/2 M. Mir, 1986
- E.Pianka. Evolutionary ecology. M. Mir, 1981
- N.Puzanov. Zoogeography. Uchpedgiz, 19.

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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Soil science	
Course Unit Code	İF-B10	
Type of Course Unit	Mandatory	
Level of Course Unit	1	
National Credits		
Number of ECTS Credits Allocated	4	
Theoretical (hour/week)	0.5	
Practice (hour/week)	0.5	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered	2	
Course Coordinator	Ulkar Gadiyeva	
Name of Lecturer (s)	Ulkar Gadiyeva	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
Soil science is included in the natural sciences, and its object of study is soil. Soil science is the science of soils, their formation (genesis), structure, composition and properties; the regularities of the geographical distribution of soils; their interaction with the environment, which determines the formation and development of their main property, fertility, ways of efficient use of soils in agriculture and other sectors of the economy, and the variability of soil cover under the conditions of use in agriculture.		
Objectives of the Course:		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Identify and describe the physical, chemical, and biological properties of soils.	
2	Classify soils based on texture, structure, and profile characteristics using standard classification systems.	
3	Explain soil formation processes and the factors influencing soil development.	
4	Analyze soil fertility and recommend appropriate soil management practices for sustainable agriculture	
5	Utilize laboratory and field methods to study and assess soil characteristics.	

6	Apply soil conservation techniques to prevent erosion and maintain soil health.		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		History of development of soil science.	
2		Concept of soil. Main properties of soil as a natural product and importance of studying soils.	
3		Soil-forming rocks and their weathering.	
4		Morphology of soil and main morphological features.	
5		Granulometric composition and structure of soil.	
6		Chemical composition of soil. Colloidal particles of soil, their composition and absorption capacity.	
7		Organic matter of soil, origin and formation of organic matter.	
8		Water in soil and its forms. Soil temperature and aeration.	
Recommended Sources TEXTBOOK(S)			

- Study of the impact of the erosion process on the thermal-physical properties of soils. Abstract. Baku-2018.
- G. Mammadov. Soil science and soil geography basics. , 2007.
- Jabbarov N. S. Assessment of the content of heavy metals in soil, water and vegetation in the Dashkesan region. Ecology and water management, Scientific technical and production journal. No. 4, Baku 2018, pp. 32-41.
- Ibrahimov Z.A., Djabbarov N.S. Assessment of the heavy metals content in soil and plant cover around the Kedabek factory on the extraction and processing of the gold own ore (Azerbaijan). Eastern European Scientific Journal. Warsaw, Poland. No. 41, 2018, pp. 32-40.
- Toprak Arazi Siniflamasi Standartlari Teknik Talimative Ilgili Mevzuat_yeni.pdf.
- Monitoring of the Impact of Agromelioration Measures on the Specific Surface Area of the Gray-brown Soils of the Abshern Peninsula. September 30, 2020. p. 24-67.
- The influence of agromelioration measures on the specific surface of the soil. Bulletin of science and practice. 2020. T

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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			4

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and Environment”.

Course Unit Title	Ecological research methods	
Course Unit Code	İF-B11	
Type of Course Unit	3	
Level of Course Unit		
National Credits		
Number of ECTS Credits Allocated	5	
Theoretical (hour/week)	1	
Practice (hour/week)	1	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered	6	
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: "Ecological research methods" is one of the main places in the educational process of the university. It would be impossible to implement the development and improvement of modern technology, industrial, pharmacological, food product quality control and environmental samples without applying ecological research methods for the determination of heavy metals, toxic substances. To explain to students the role of ecological research methods used to determine the sources and levels of pollution of air, water and soil during environmental monitoring.		
Objectives of the Course:		
To explain to students in detail the use of conductivity, radiation absorption or emission, mass-to-charge ratios, etc. properties of substances determined in natural and industrial environmental samples in inorganic, organic and biochemical quantitative analyses, in addition to using classical methods in solving ecological problems. To explain to students the changes that occur as a result of the interaction of the substance determined in instrumental methods with electromagnetic radiation.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Formation of ideas about the interaction of ecological factors on the organism and vice versa, about the influence of organisms on the environment.	
2	Formation of ideas about global ecological problems.	
3	Formation of ideas about the modern ecological state of natural environments: air, water and soil; - Formation of ideas about ecological research methods such as atomic absorption, atomic mass, inductively coupled plasma spectrometry, chromatographic analysis, extraction.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Ecology - as a methodological and theoretical basis of the use of nature.	
2		Theoretical foundations of ecological research.	
3		Methodological foundations of ecological research.	
4		Concept of ecological research methods.	
5		Ecological monitoring.	
6		Bioecological research methods. Ecological and geographical characteristics of the territory in conducting ecological research.	
7		Special ecological methods in the study of plant and animal communities.	
8		Geophysical methods in the study of ecosystems.	
9		Geochemical methods in the study of natural and anthropogenic ecosystems.	
10		A complex of ecologically oriented engineering and geological methods. Purpose, tasks and methods of hydrogeological observations of the environment.	
11		Ecological bioindication methods.	
12		Physicochemical foundations of ecological research methods: spectral and optical analysis methods.	

13		Physicochemical foundations of ecological research methods: electrochemical and chromatographic analysis methods.	
14		Remote methods of ecological research.	
15		Mathematical modeling of ecological systems. Systematization and generalization of ecological data.	
Recommended Sources TEXTBOOK(S)			
<ul style="list-style-type: none"> – R.A. Aliyeva, S.R. Hajiyeva, A.G. Huseyinli. Instrumental analysis methods. Science and education, Baku, 2010 - 280 p. – Heinz-Helmut Perkampus. UV-VIS Spektroskopy and its Applications. London, 1992, 244 p . – A.Yıldız, C.Gemza, S.Bekdaş. Enstrumental analiz. Hacattepe Univ., Ankara 1999, 580 s. – R.M.Smit. Gaz and Liquid Chromatography in Analytical Chemistry. New York 1988, 540 p. – E.Hetman.Fundamentals and Applications of Chromatography and Elektrophoretic Methods. Elsevier, New York 1993, 496 p. – Zh. A. Antonova, E. V. Rassadina. Methods of environmental research. A textbook for students studying in the bachelor's program in the direction "Ecology and Nature Management" Ulyanovsk, 2015, 109 p. – Yu. Yu. Nikiforenko, O. A. Melnik. Methods of environmental research. A textbook. Krasnodar, 2022, 87 p. – M. G. Yasoveev, A. I. Kalashnikova. Methods of environmental research. A teaching aid. Minsk, Information Technology Center of the Ministry of Finance, 2018, 232 p. – V. Biryukova, K. I. Dagargulia, A. Yu. Pribylov, V. V. Chernaya. Methods of environmental research: a teaching aid. Ryaz. state University named after S. A. Yesenin. — Ryazan, 2007. — 76 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			
<ul style="list-style-type: none"> • 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	240
Total Workload/30(h)	240/30
ECTS Credit of the Course	5

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Landscape Science and Landscape Ecology	
Course Unit Code	İF-B12	
Type of Course Unit	Mandatory	
Level of Course Unit		
National Credits		
Number of ECTS Credits Allocated	5	
Theoretical (hour/week)	1	
Practice (hour/week)	1	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered		
Course Coordinator	Aruz Mikayılov	
Name of Lecturer (s)	Aruz Mikayılov	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani,Russian,English	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description: As a result of the rapid growth of the world's population, a number of major ecological and natural problems have arisen. One of the most urgent processes of the 21st century is the process of excessive damage to natural landscapes and their replacement with cultural and anthropogenic landscapes. The protection of landscapes for the restoration of nature itself, the study and application of this field, and research are considered to be the most important issues. In this regard, the demand for the subject of "Landscape Science and Landscape Ecology" is increasing. The main goal of this subject is to study human-nature relations and determine the main directions of efficient use of nature, thereby determining ways to maintain ecological balance.		
Objectives of the Course:		
The subject taught includes the most relevant topics of today. There is no doubt that this 60-hour course is an indispensable subject for ecologists. The goal and purpose of the subject are also highlighted in the description of the subject. This subject is of great importance in preparing specialists who will work with nature, society, and the field of geography.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	The main basis for studying the subject is the general natural sciences that students have studied in previous courses. Discussions about the environment were held at certain hours in the same subjects. In the future, the possibility of progress and development in scientific and business careers without studying the subject "Landscape Studies and Landscape Ecology" in the application of theoretical knowledge may be questionable.	

Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		The emergence, subject, content of landscape science. The emergence and development of landscape teaching.	
2		Landscape and its structure. Geographical strata and the main stages of development of the landscape sphere.	
3		Landscape classification. Principles and directions of landscape classification.	
4		Landscape morphology.	
5		The boundaries of landscape complexes.	
6		Landscape dynamics and evolution.	
7		Landscape geochemistry, geophysics. Landscape forecast.	
8		The concept of zonality. Latitudinal zonality. Azonal and introzonal differentiation of landscapes.	
9		Anthropogenic landscapes.	

10		Grouping of anthropogenic landscapes according to their content and degree of change.	
11		Landscape ecology. Grouping of landscapes according to their ecological state.	
12		Ecological characteristics of landscapes.	
13		Ecological assessment of landscapes. Ecological classification of landscapes.	
14		Organization of landscape protection in the system of specially protected areas.	
15		Specially protected areas of the Republic of Azerbaijan.	
Recommended Sources TEXTBOOK(S) <ul style="list-style-type: none"> – Suleymanov M.A, Aliyeva I.S. Fundamentals of Landscape Science. Baku 1998. – Garibov Y.A. Anthropogenic transformation of natural landscapes of the Republic of Azerbaijan, Baku “Mars Print”, 2011. 198 p. – Garibov Y.A. Optimization of natural landscapes of the Republic of Azerbaijan, Baku, 2012. 185 p. – Internet resources. – Avessalomova, I.A. Ecological assessment of landscapes. Moscow, 1992. 120 p. – Alekseenko, V.A. Landscape geochemistry and the environment. Moscow: Nedra, 1990. – 142 p. – Vinogradov, B.V. Fundamentals of landscape ecology. Moscow: Geos, 1998. – 418 p. – Golovanov, A.I. Landscape science. Moscow, 2005. – 214 p. – Kolbovsky, E.Yu. Landscape science: textbook / Moscow: Academy, 2008. – 336 p. – Milkov F.N. Landscape sphere of the earth. Moscow, 1970, 207 p. – Demidenko, G.A. Landscape science: textbook. manual [Electronic resource] / Krasnoyarsk state agrarian university. – Krasnoyarsk, 2018. – 139 p. – Beruchashvili, N.L. Geophysics of landscape / N.L. Beruchashvili. – M.: Higher school, 1990. – 287 p. – Museibov M.A. Landscapes of Azerbaijan B., 2000., 145 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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Human ecology and sustainable development
Course Unit Code	İF-B13
Type of Course Unit	Mandatory
Level of Course Unit	3
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	6
Course Coordinator	Natavan Karamova
Name of Lecturer (s)	Natavan Karamova
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani, Russian, English
Prerequisites	-
Recommended Optional Program Components	-
Course description: The subject "Human Ecology and Sustainable Development" clarifies the stages of development of the human body, its formation as an individual, the mechanism of anthropological, histological, anatomical formation and physiological processes. Thus, the stages of development of anthropogenesis, the early evolution of primates, the first representatives of homo erectus and archanthropes, paleanthropes, neanthropus-modern man, the study of races, the race of modern man and their classification, ethnic groups and languages, language groups and areas of distribution of people, the history of the development of ethnic groups, modern features of ethnogenesis, demographic problems and development, the noosphere, the scientific and technical revolution and displacement of the Earth's population, the anatomical structure and physiology of man, higher nervous activity, etc. are taught, thereby clarifying the place and role of man among living beings. The study of this field is of great practical importance for the development of the science of biology and anthropology.	
Objectives of the Course:	
The Human Ecology course reflects a methodological approach for a broad and comprehensive study of	

<p>biological processes occurring in humans and animals, which are the objects of scientific research. The main goal of the course is to study the highest being, the human being, at the level of the organism. By studying this course, students will understand the human body as a single system. Thus, this specialty course aims to provide students with deeper knowledge about the functional organization of the body, enabling them to understand ecology, applied biology and medicine, as well as other related fields of science, in the future, and to raise their intellectual level.</p>		
<p>Learning Outcomes</p>		
<p>At the end of the course the student will be able to</p>		<p>Assessment</p>
1	<p>Information and research methods about human ecology; Detailed information about Anthropology - the science that studies humans in a complex way, the role of anatomy, physiology and histology in the study of the human body.</p>	
2	<p>Information about the stages of development of anthropogenesis, early evolution of primates, the first representatives of homo erectus and archanthropes, paleonthropes, neanthropus-modern man; Study of races, modern human races and their classification, ethnic groups, language groups of people and areas of distribution. History of development of ethnic groups. Modern features of ethnogenesis. Demographic problems and development. Noosphere. To give a broad explanation of the scientific and technical revolution and displacement of the Earth's population.</p>	
3	<p>The basic structural unit of the human body is the cell. Detailed information on the structural elements of the cell and their role, epithelial tissue, connective tissue, muscle tissue, and nervous tissue; Systems of the human body. About the structure of bones, skeleton, and joints. Explanation of the muscular system and classification of muscles; Structure of the nervous system. Comparative explanation of the central and peripheral nervous systems.</p>	
4	<p>About the endocrine system. Classification of human endocrine glands and their role in human life; Reproductive organs. Stages of human embryonic development. Features of postnatal development periods. Information about lactation; Detailed information about the cardiovascular system, blood circulation. Explanation of the formed elements of blood and the properties of lymph; Respiratory system, structure of the lungs and bronchi, clarification of their role in human life; Structure, classification of the digestive system, explanation of the features of the physiology of digestion;</p>	
5	<p>General information about sensory systems. Classification of analyzers. Comparative analysis of sensory organs and their functions; Higher nervous system. The role of behavior in human life, explanation of the features of the formation of cognitive processes. Immune system features. The main mechanisms of heat production and heat dissipation. Bringing extensive information about metabolism to the attention of students.</p>	
<p>Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz</p>		
<p>Course's Contribution to Program</p>		
		<p>CL</p>

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

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

Course Contents

Wee k	Chapter	Topics	Exam
1		Information about human ecology. Subject, tasks, and goals of human ecology. About human ecosystems. Research methods of human ecology. Detailed explanation of anthropology – the science that studies humans in a complex way. The role of anatomy, physiology, and histology in the study of the human body.	
2		Stages of development of anthropogenesis. Early evolution of primates. Homo erectus and the first representatives of archanthropes. Paleonthropes. About Neanderthals - modern humans.	
3		The study of races, the race of modern man and their classification. Ethnic groups. Language groups of people and their distribution areas. History of the development of ethnic groups. Modern features of ethnogenesis. Demographic problems and development. Noosphere. Scientific and technical revolution and displacement of the Earth's population.	

4		The basic structural unit of the human body is the cell. Detailed information about the structural elements of the cell and their role, epithelial tissue, connective tissue, muscle tissue, nervous tissue.	
5		Systems of the human body. About the structure of bones, skeleton and joints. Muscular system and classification of muscles.	
6		Structure of the nervous system. Comparative explanation of the central and peripheral nervous systems.	
7		Higher nervous system. The role of behavior in human life, the formation of cognitive processes.	
8		About the endocrine system. Classification of human endocrine glands and their role in human life.	
9		Reproductive organs. Stages of human embryonic development. Features of postnatal development periods. Lactation.	
10		Detailed information on the cardiovascular system, blood circulation. Formed elements of blood and lymph. Respiratory system, structure of the lungs and bronchi, their role in human life.	
11		Structure, classification of the digestive system, physiology of digestion. Excretory system. Form and function of the kidneys, bladder and ureters.	
12		General information about sensory systems. Classification of analyzers. Sense organs and their functions.	
13		Immune system properties. The main mechanisms of heat production and heat dissipation. Extensive information about metabolism.	
14		The ecological role of food factors in nutrition and human health protection.	
15		Laws between the basics of ecology and human health.	

Recommended Sources

TEXTBOOK(S)

- Mammadov G., Mammadova S., Huseynov E., Hashimov A. Human ecology (Anthropoecology). Baku 2015.
- Korobkin V.I., Peredelski L.V.. Ecology. Baku 2013.
- Mammadov A.M., Sudakov K.V. Normal physiology. Baku 2012.
- Jafarov F.I., Human physiology, part I-II, Baku, 2011.
- Shadlinski V.B. and others. Atlas of human anatomy. Baku, 2009.
- Shadlinski V.B. and others. Human anatomy I, II, III volumes. Baku, 2008.
- Anatomical terminology (edited by V.B. Shadlinski). Baku, 2009
- Ismayilov O.B., Ismayilov T.M., Mahmudov R.M. Normal physiology. Baku, 2008.
- K. Balakishiyev. Normal human anatomy. Volumes I, II, III. Baku, 1982.
- Hawley A. H. Human Ecology.A Theoretical Essay.USA.2008
- Dyball R., Barry N. Understanding Human Ecology. A systems approach to sustainability. USA.2015.
- Sylvia S.M. Understanding Human Anatomy and Physiology, Fifth Edition, The McGraw-Hill Companies – 2004
- Sherwood L. Fundamentals of Human Physiology, Fourth Edition, 2010.
- Khaskin V.V., Trifonova T.A., Akimova T.A. Human ecology. Moscow, 2008.
- Nesmelova, N.N. Human ecology: a textbook and workshop for universities / Moscow: Yurait Publishing House, 2023.
- Trifonova T.A. Applied human ecology: a textbook for universities / Moscow: Yurait Publishing House, 2023.
- Gora E.P. Human ecology. Moscow, 2007.
- Maksimov V.I., Ostapenko V.A., Fomina V.D., Ippolitova T.V. Human biology. Moscow, 2015.

- Prives M.G. et al. Human anatomy. Moscow-2010.
- Ilinykh I.A. Human ecology 2020.
- Arkhangelsky V.I., Kirillov V.F. Human Hygiene and Ecology. Textbook, 2020.
- Jonathan S.F. "Weather is Us". Moscow: Eksmo, 2020.
- David W.-W. "Uninhabitable Earth. Life after Global Warming". Moscow: Individuum, 2020.
- Krymskaya I.G. Human Hygiene and Ecology: Textbook, 2020.
- Kassan A. Human Anatomy. Moscow-2011.
- Sinelnikov R.D. Atlas of Human Anatomy. Moscow-1996.
- Vincent P. Large Atlas of Human Anatomy. Moscow, 2015.
- General Course of Human and Animal Physiology. Textbook. In 2 books: (ed. by A.D. Nozdrachev., Moscow, Higher School, 1991).
- Kamensky A.A. Human Physiology. Simply about the Complex. Moscow, 2018.
- Solodkov A.S., Sologub E.B. Human physiology. General. Sports. Age. Moscow-2015.
- Filimonov V.I. Human physiology. Moscow-2012.
- Selezneva T.V. Pocket atlas of human anatomy. Moscow-2017.
- Samusev R.P. Atlas of human anatomy. Moscow -2018.
- Aliev S.D. et al. Medical biology in terms and concepts. Baku, 2010.
- Sandrigailo L.I. Anatomical and clinical atlas of neuropathology. Baku, 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

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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Air and water quality, pollution and protection	
Course Unit Code	İF-B14	
Type of Course Unit	Mandatory	
Level of Course Unit	2	
National Credits		
Number of ECTS Credits Allocated	6	
Theoretical (hour/week)	1.5	
Practice (hour/week)	1	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered	4	
Course Coordinator	Ulkar Gadiyeva	
Name of Lecturer (s)	Ulkar Gadiyeva	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
By studying the subject "Air and Water Quality, Pollution and Protection", the student acquires theoretical knowledge about biological monitoring of the environment, has detailed information on issues such as the modern normative basis of biomonitoring, environmental assessment based on the state of biota, determination of ecological norms of technogenic impact on the environment based on biological criteria, control of biological pollution, biological methods of environmental protection, use and development prospects of biological monitoring. During the teaching of this subject, the student must be able to carry out biological monitoring of terrestrial and aquatic ecosystems, apply the main methods of bioindication and biotesting, and correctly use the results of biomonitoring.		
Objectives of the Course:		
The main objective of the subject is to study the basics of modern methods and methodology of bioindication and biotesting; regularities of biota's response to natural and anthropogenic factors; methods and principles of observation, assessment and forecasting of the state of the biotic environment; normative basis of biological monitoring; protection of air and water, prevention of air and water pollution.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	The main goal of the subject is to provide information on the modern methods and foundations of bioindication and biotesting methodology; regularities of biota response to natural and anthropogenic factors;	
2	methods and principles of observation, assessment and forecasting of the state of the biotic environment; normative basis of biological monitoring;	
3	biological components of ecological monitoring, etc. to provide information on	

	issues.		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		The goals and objectives of the subject "Air and Water Quality, Pollution and Protection".	
2		The role of air in human life, air protection.	
3		Global ecological anomalies in the atmosphere.	
4		Sources of air pollution and measures to combat it.	
5		The water layer of the Earth	
6		Physical-ecological and chemical-ecological indicators of water and their importance.	
7		General sanitary assessment of drinking water.	
8		Atmospheric monitoring.	
9		Hydrosphere monitoring.	
10		The impact of high atmospheric air temperature on the health of the	

		population.	
11		Requirements for water quality.	
12		Integrated management of water resources is a guarantor of the safety of ecosystems.	
13		Depletion of the ozone layer	
14		Pollution of the world's oceans and seas.	
15		Global hydrological crisis.	
16		Weather regime, weather forecast and synoptic map.	
17		Weather processes (events).	
18		Water use in the world.	
19		Main characteristics of the hydrosphere.	
20		Strategy of the Republic of Azerbaijan for the protection of the ozone layer.	
21		Purification of waste discharged into the atmosphere.	

Recommended Sources TEXTBOOK(S)

- Abbasov M.J. – Global ecological problems of our century. Monograph, Baku, “Elm”, 2006.
- Abbasov E.M. – Human ecology: biological and sociological aspects. Monograph, Baku, “Elm-Tehsil”, 2005.
- Askerov A.A., Huseynov E.M. – Modern ecology (introduction to ecology). Textbook, Ganja, “Asgeroglu”, 2004.
- Mammadov G.Sh. – Ecoethical problems of Azerbaijan: scientific, legal, moral aspects. Baku, “Elm”, 2004
- Mammadov G.Sh., Khalilov M.Y. – Ecology and environmental protection. Baku, “Elm”, 2005.
- Mustafayev G.T., Tagiyev A.N. – Modern applied ecology. Methodical manual, Baku, BSU, 2008.
- Ahmadov Sh. “Engineer ecology”. Baku, 2012.
- Imanov F.A., Alekbarov A.B. “Modern changes and integrated management of water resources of Azerbaijan”. Baku, 2017.

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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			6

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Environmental law		
Course Unit Code	İF-B15		
Type of Course Unit	Mandatory		
Level of Course Unit			
National Credits			
Number of ECTS Credits Allocated	4		
Theoretical (hour/week)	1		
Practice (hour/week)	0.5		
Laboratory (hour/week)			
Year of Study			
Semester when the course unit is delivered			
Course Coordinator	Arzu Mustafayev		
Name of Lecturer (s)	Arzu Mustafayev		
Name of Assistant (s)	-		
Mode of Delivery	Face to face		
Language of Instruction	Azerbaijani		
Prerequisites	-		
Recommended Optional Program Components	-		
Course description:			
The subject "Environmental Law" provides information on the normative legal framework in the field of environmental and biological diversity protection, as well as legal issues in the field of environmental protection and remediation.			
Objectives of the Course:			
Formation of the concept of environmental law among students, study of legislative acts in the field of environmental protection, resolution of legal issues, disciplinary sanctions and legal requirements related to their application.			
Learning Outcomes			
At the end of the course the student will be able to			Assessment
1	By learning the basics of independent environmental law, students become familiar with local and international environmental law, international legal obligations, as well as administrative and criminal law in environmental offenses, and the processes for resolving legal issues.		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		The concept of ecological law, legal normative framework in the field of environment.	
2		International ecological law, international conventions to which the Republic of Azerbaijan is a party.	
3		Law of the Republic of Azerbaijan on specially protected natural areas and objects.	
4		Environmental offenses in the Code of Administrative Offenses of the Republic of Azerbaijan.	
5		Environmental offenses in the Code of Administrative Offenses of the Republic of Azerbaijan.	
6		Environmental offenses in the Criminal Code of the Republic of Azerbaijan.	
7		Law of the Republic of Azerbaijan on "State Ecological Expertise".	
8		Law of the Republic of Azerbaijan on "Animal World".	
9		Law of the Republic of Azerbaijan on "Atmospheric Air" and "Subsoil".	

10		Law of the Republic of Azerbaijan on "Hunting".	
11		Decisions of the Cabinet of Ministers ensuring environmental regulation and the mechanism of their application.	
12		Decisions of the Cabinet of Ministers ensuring environmental regulation and the mechanism of their application.	
13		"Administrative Procedure Code" of the Republic of Azerbaijan.	
14		Authorities implementing environmental law and their powers.	

Recommended Sources

TEXTBOOK(S)

- Q.T.Mustafaev, E.A.Alizadeh – Ecology, Baku, «Ozan»- 2001.
- Mammadov G.Sh., Khalilov M.Y. Encyclopedic ecological dictionary. Baku-Elm-2008
- N.A.Salimova, B.Sh.Shahpalangova, A.I.Babayev. Engineering ecology. Baku-2012
- T.S.Mammadov, H.H.Asadov "Plant ecology" "Elm" publishing house, Baku-2014
- A.A.Asgarov, F.G.Aliyev, E.M.Huseynov, S.T.Aliyev "Modern ecology" Baku-2007
- Code of Administrative Offenses of the Republic of Azerbaijan
- Criminal Code of the Republic of Azerbaijan
- Code of Administrative Procedure of the Republic of Azerbaijan

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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			4

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and Environment”.

Course Unit Title	Ecological cartography and GIS	
Course Unit Code	İF-B16	
Type of Course Unit	Mandatory	
Level of Course Unit	4	
National Credits		
Number of ECTS Credits Allocated	8	
Theoretical (hour/week)	1.5	
Practice (hour/week)	1.5	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered	7	
Course Coordinator	Masuma Piriyeva	
Name of Lecturer (s)	Masuma Piriyeva	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani,English, Russian	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description: The aim of the course "Environmental Mapping" is to develop students' knowledge of the theoretical foundations and methodology of environmental mapping and to develop skills applied in the visualization of ecological and geographical situations and their stress levels in the environment. During the course, students become familiar with the technology of ranking the stress levels of ecological and geographical situations and the technologies, qualitative and quantitative characteristics and development dynamics of traditional and innovative tools for mapping environmental processes.		
Objectives of the Course:		
The aim of the course is to acquaint students with the methods of modern cartography and geographic management systems. To learn about the essence of ecological cartography, the factors influencing the management system of new methods of the environment.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Objectives, tasks, methods, place of ecological cartography in the system of sciences;	
2	to acquire basic concepts and knowledge;	
3	to study the essence of ecological cartography, the basic laws, rules, concepts and terminology of modern GIS;	
4	Objectives, tasks, methods, place of ecological cartography in the system of sciences;	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		The main goal, object and methods of environmental cartography.	
2		The history of the emergence of cartographic science.	
3		Environmental map and environmental cartography.	
3-4		Environmental map and environmental cartography.	
4		Mathematical foundations of environmental maps.	
5		Classification of environmental maps.	
6		The importance of the science of environmental cartography for training environmental specialists.	
7		Scientific and methodological foundations, sources of information and modern technologies for environmental mapping.	
8		Scientific and methodological foundations, sources of information and modern technologies for environmental mapping.	
9		Compilation and content of environmental maps of various scales and purposes.	
10		Methodology of environmental mapping	
11		The importance of climate maps.	
12		Description of climate change on maps.	
13		Environmental foundations of hydrographic maps.	
14		Landscape foundations of environmental maps.	
15		Description of landscapes on maps and basic symbols.	

16		Cartographic description of global environmental problems of the world.	
17		Cartographic description of global environmental problems of the world.	
18		Environmental symbols.	
19		Analysis of environmental maps.	
20		Mapping air pollution using mobile environmental laboratories.	
21		Aerospace research and remote sensing.	
22		Geographical information systems	
23		Projection and date.	
24		Natural-territorial complexes-objects of mapping.	
25		The scale of modern and predicted anthropogenic impacts on humans and the environment within the framework of the concept of sustainable development.	
26		Main types of space launch vehicles and working orbits.	

Recommended Sources

TEXTBOOK(S)

- Babazade V.M., Ramazanov V.G., Qalandarov B.H., Khasayev A.I., Mansurov M.I., Mammadov Z.I. Structures of ore fields and deposits. Baku, NPM "Tehsil" ed. 2013, 287p.
- Mammadov G.Sh., Hashimov A.J., Verdiyev A.E., Mammadova E.A. Fundamentals of engineering geology. Baku, Elm ed., 2012, 800 p.
- Masimov A.E., Mammadova E.A. Geophysical and aerospace methods in hydrogeological and engineering-geological research. Baku, "Laman Publishing House Polygraphy" LLC, 2008, 120p.
- Amursky G. I., Bondareva M. S., Kats Ya. G., et al. Study of tectonics of oil and gas bearing regions using space images. Moscow: Nedra, 1985, 143 p.
- Aerospace methods of geological research [Text]: monograph / edited by A. V. Pertsov. - St. Petersburg: Publishing house of St. Petersburg. Cartographies "VSEGEI", 2000, 316 p.
- Komissarov Yu. A., Gordeev L. S., Edelstein Yu. D., Vent D. P. Ecological monitoring of the environment. V. 1 and 2, Moscow "Chemistry". 2005, 764 p.
- Kalinin V. M. Monitoring of natural environments. Tyumen State University. 2007, 208 p. 9. Vinogradov B. V. Aerospace monitoring of ecosystems. Moscow: Nauka, 1984, 318 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

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

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Industrial ecology
Course Unit Code	İF-B17
Type of Course Unit	Mandatory
Level of Course Unit	3
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hour/week)	1
Practice (hour/week)	0.5
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	5
Course Coordinator	Ulviyya Karimova-Jafarova
Name of Lecturer (s)	Ulviyya Karimova-Jafarova
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani,Russian,English
Prerequisites	-
Recommended Optional Program Components	-

Course description:

As a result of the rapid increase in the world's population, a number of global, regional and local environmental problems have arisen. The subject of industrial ecology studies the impact of production and processing industries on the environment and its consequences at the current stage of rapid population growth. During the teaching of this subject, comparison, observation, statistical analysis, analysis of satellite images, and cartographic methods are used.

As a result of the teaching of the subject of industrial ecology, students will learn information about industrial sectors, their location features and types, and their importance, as well as be able to determine the negative impacts of these sectors on the environment, their consequences, and ways to prevent them.

Objectives of the Course:

The subject taught reflects the most current topics. The main goal of the subject of industrial ecology is to teach our students the impact of individual branches of industry and various means of transport on the environment and its consequences. In this regard, there is no doubt that this 45-hour course is a subject dedicated to current topics.

The main goal of teaching the subject “Industrial Ecology” is the following:

- providing a broad explanation of the causes of the emergence of anthropogenically influenced environmental problems;
- providing information about the impact of industry on the lithosphere, hydrosphere, atmosphere and ecology of the biosphere;
- information about various production wastes of various branches of industry;
- explanations about the ecology of various industrial sectors, utilization or efficient recycling of generated waste;
- information about the analysis of pollutants

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	After completing the course, students will independently: acquire knowledge about the role of industry in the share of harmful waste discharged into the environment.	
2	Industrial sectors, their types and location characteristics, importance; impact of industrial sectors on the environment.	
3	The results and assessment of the impact of industrial sectors on the environment and will be able to make independent judgments on the issues indicated.	

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

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

	information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		History of the discipline, goals and objectives. Main types and principles of location of industrial sectors.	
2		Ecological problems of the fuel and energy complex and ways to solve them.	
3		Nuclear energy and ecological problems.	
4		The role of alternative energy sources in environmental protection.	
5		Ecological problems of mining and quarrying enterprises.	
6		Ecological problems of metallurgical industry enterprises.	
7		Ecological problems of chemical and petrochemical industry enterprises.	
8		Ecological problems of machine-building industry enterprises.	
9		Ecological problems of building materials and forest industry.	
10		Methods of cleaning waste gases emitted into the atmosphere from industrial enterprises.	
11		Treatment of waste waters of industrial enterprises.	
12		Ecology of transport. Structure and types of transport, ecological impact on the natural environment and people	
13		Wastes of industrial enterprises and methods of their reuse. Waste-free and low-waste technologies.	
14		Ecological regulation and monitoring of the environment.	

Recommended Sources

TEXTBOOK(S)

- A.M. Maharramov, M.R.Bayramov, I.G.Mammadov “General Chemical Technology” 308 p., 2011
- M.G.Mammadli, “Technology of Oil and Gas Processing” 1964
- J.M.Mahmudov “Technology of Production Areas and Industrial Ecology”, 2006
- N.A.Salimova, B.Sh.Shahpalengova, A. Babayev “Engineering Ecology” 634 p., 2012
- N.A.Salimova New Ecologically Safe Processes. Textbook, Azerbaijan State Oil Academy. Baku: ADNA, 2009, 162 p.
- Vronsky V.A. Ecology and the environment: a reference book / Moscow; Rostov-on-Don: March, 2008. 432 p.
- Shilov I.A. Ecology: a textbook for students of higher educational institutions / 7th ed. Moscow: Yurait, 2012. 512 p.
- N.A. Strakhova, E.V. Omelchenko. Ecology and nature management: a study guide / Rostov-on-Don: Phoenix, 2007, 252 p.
- M.I. Rustamov, V.M. Abbasov, T.A. Mamedova, N.N. Piriev. Environmental problems of the Earth and alternative energy sources. Baku, Elm, 2008, 717 p.
- Handbook of an environmental engineer / edited by V.P. Perkhutkin.M. : Infra-Engineering, 2005, 864 p.
- M.G. Yasoveev, E.V. Kakareka, N.S. Shevtsova, O.V. Shershnev / Industrial Ecology: manual, Minsk - BSPU, 2010, 220 p.

<ul style="list-style-type: none"> - L.I. Bondaletova, V.G. Bondaletov. Industrial Ecology: textbook / Tomsk: Publishing House of Tomsk Polytechnic University, 2008, 247 p. - Varenkov A.N., Kostikov V.I. Chemical Ecology and Engineering Safety of Metallurgical Production: textbook for universities / Moscow: Internet Engineering, 2000, 382 p. - Engineering Ecology: textbook / Ed. V.T. Medvedev. / Moscow: Gardariki, 2002, 687 p. - Rustamov M.I. Environmental problems of the Earth and alternative energy sources / M.I.Rustamov, V.M. Abbasov, T.A.Mamedova, N.N.Piriev. - Baku: ELM, 2008, 			
Assessment			
Attendance	10%	At least 75% class attendance is compulsory	
Presentation	10%		
Quiz	0%		
Seminars	30%		
Midterm Exam	0%		
Final Exam	50%		
Total	100%		
Assessment Criteria			
Final grades are determined according to the Academic Regulations of WCU			
Course Policies			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			4

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Ecological Chemistry
Course Unit Code	İF-B18
Type of Course Unit	Mandatory
Level of Course Unit	2

National Credits		
Number of ECTS Credits Allocated		6
Theoretical (hour/week)		1
Practice (hour/week)		0.5
Laboratory (hour/week)		0.5
Year of Study		
Semester when the course unit is delivered		3
Course Coordinator		Narmina Abdullayeva
Name of Lecturer (s)		Narmina Abdullayeva
Name of Assistant (s)		-
Mode of Delivery		Face to face
Language of Instruction		Azerbaijani, English, Russian
Prerequisites		-
Recommended Optional Program Components		-
Course description:		
<p>The main task of the course is the study of chemical processes occurring in the environment, including human activity (farming, industry, military, etc.), directly and indirectly affecting people and chemical processes occurring in the geosphere (atmosphere, hydrosphere and lithosphere). The subject "Environmental Chemistry" is closely related to general and inorganic chemistry, organic chemistry, petrochemistry, etc. disciplines. The application of new technologies, the impact of chemicals on the environment and the formation of methods for monitoring its condition.</p>		
Objectives of the Course:		
<p>The main goal of teaching the subject "Ecological Chemistry" is to provide the following explanations:</p> <ul style="list-style-type: none"> - providing a broad explanation of the causes of anthropogenic environmental problems; - providing information about environmental problems arising in the lithosphere, hydrosphere, atmosphere and biosphere; - providing information about environmental problems arising from the use of chemical agents; - information about various production industries of chemistry and other industries; - explanations about environmental problems arising from food contamination caused by the use of chemical agents and their elimination; - information about the analysis of pollutants 		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	The subject "Ecological Chemistry" is closely related to the complexes of technical sciences, which are important for studying. It is impossible to study and understand this course without knowledge in the fields of chemistry, biology, physics, mechanics. All this is important for in-depth study of the knowledge characteristic of natural, mathematical and technical sciences. Students will be able to:	
2	-chemical pollution of the environment and soil, -the characteristics of the impact of the main pollutants on the environment and soil.	
3	the characteristics of the impact of various areas of human economic activity on the environment, -the main standards of environmental quality,	
4	the impact of chemical pollution on human health, -the main ways of implementing environmental protection activities,	

	-the use of qualitative and quantitative indicators for assessing anthropogenic impact on the environment		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		Environmental problems of the chemical industry, their causes.	
2		Environmental problems caused by chemical industry waste in the environment.	
3		Ways to solve environmental problems caused by chemical industry products.	
4		Ecological problems arising during the production of mineral acids.	
5		Ecological problems caused by pesticides in the environment.	
6		Sources of soil pollution, its ecological danger and prevention.	
7		Ecological problems caused by solid chemical industrial waste in the soil.	
8		Ecological problems caused by the application of mineral fertilizers.	

9		Sources of raw materials used in the production of mineral fertilizers.	
10		Pollution of the environment with harmful substances in the production of phosphorus fertilizers.	
11		Ecological problems caused using nitrogen fertilizers.	
12		Information on the pollution of the Absheron Peninsula's soil with oil and oil products and their ecological danger.	
13		Agricultural problems, their causes.	
14		Ecological problems caused using nitrogen fertilizers.	
15		Methods of wastewater treatment of agricultural complexes	
16		Ecological problems arising during the treatment of biogenically polluted waters.	
17		Problems caused by climate change in agriculture.	
		Lab 1. Atmospheric air monitoring. Determination of dust in the air. determination of SO ₂ . Determination of nitrogen (IV) oxide. Determination of aerosols of sulfuric acid and soluble sulfates	
		Lab 2. Soil monitoring/ Determination of hydrogen sulfide in soil contaminated with petroleum products. Determination of copper. Determination of nitrate nitrogen	
		Lab 3. Monitoring of water bodies. Transparency, Sediment, color, odor, taste and flavor	
		Lab 4. Monitoring of water bodies. Determination of active reaction (pH). Determination of dry residue. Determination of total hardness	
		Lab 5. Monitoring of water bodies. Determination of chlorides. Determination of total iron by photometric method	
		Lab 6. Monitoring of water bodies. Determination of permanganate oxidation. Determination of ammonium ion. Determination of nitrogen. Determination of nitrate nitrogen	
		Lab 7. Monitoring of water bodies. Determination of dissolved oxygen by Winkler's rule. Determination of surfactants	
		Lab 8. Epidemic indicator characterizing water safety	

Recommended

Sources TEXTBOOK(S)

R.A.Aliyeva, S.R.Hajiyeva, A.G.Huseynli, P.R.Mammadov, H.Ibadov, G.I.Bayramov. Environmental Chemistry, UniPrint, Baku, 2013, 280 p.

Alimov A. M., Akhmetov T. M., Volkov A. Kh., Kasanova N. R. Ecological Chemistry. Textbook. Lan, St. Petersburg, 2023, 144 p.

Ivankin A. N. Ecochemistry. Textbook. Lan, St. Petersburg, 2023, 108 p.

Melitovskaya I. N. Ecological Chemistry. Practical Work. Tutorial. Lan, St. Petersburg, 2023, 44 p.

Egorov V. V. Ecological Chemistry. Textbook. Lan, St. Petersburg, 2022, 184 p.

Motuzova G. V., Karpova E. A. Short Course in Ecological Chemistry. Textbook. Moscow: World of Science, 2020. 258 p.

Jorge G. Ibanez, Margarita Hernandez-Esparza, Carmen Doria-Serrano, Arturo Fregoso-Infante. Environmental Chemistry. Yale University. Springer, 2007, 334 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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			6

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Forestry
Course Unit Code	İF-B19
Type of Course Unit	Mandatory
Level of Course Unit	3
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	1.5
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	5
Course Coordinator	Shahbaz Shiraliyev
Name of Lecturer (s)	Shahbaz Shiraliyev

Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani, English, Russian	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
In forestry, extensive materials are taught about the importance of forest plants, the basic principles of natural and artificial reproduction of the main forest-forming species, the relationship of plants in forests with the environment, ecological situations and differentiation of forest species, the exceptional role of biocenosis, especially forests, in the purification of the atmosphere and the creation of water abundance, and the formation of fertile soils, and their protection.		
Objectives of the Course:		
The main goal of teaching the subject is to teach students about the role of forest plants in human life, greening, the role of forests in the formation of biomass in nature, the importance of forests in the environment surrounding us, the processes occurring in forest biocenosis, its impact on the environment, the economic, ecological, and social functions of forests, and ways to protect them.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	The importance of forest cover, determining the exceptional role of forests in the ecological environment.	
2	The structure of the forest fund, technical characteristics and rules of use of plants common in forests.	
3	Studying the rules of primary and intermediate use of forests, the role of intermediate use in the development of forests.	
4	Determining the diseases and pests prevalent in existing plants in forests, and ways of protecting against them.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		History of development of forestry science.	
2		Forestry, classification of trees growing in forests.	
3		Ecological bases of formation of biological diversity of forests.	
4		Forest and ecological environment.	
5		Forest restoration.	
6		Replacement of pine with fir and fir with pine	
7		Progress of replacement in oak forests.	
8		Replacement of beech, hemlock and chestnut with other species in deciduous oak forests.	
9		Forest types. Forest types according to G.F. Morozov, P.S. Pogrebnyak, V.N. Sukachev and V.G. Nesterov.	
10		Forest types of foreign countries and Azerbaijan.	
11		Ecological study of forest types.	
12		Soil-conserving, water-conserving and recreational forests.	
13		National brands.	
14		Forestry and world forest congresses.	
15		Service felling methods: lighting, clearing, thinning and transitional felling.	
16		Service fellings, sanitary fellings and landscape fellings in forest parks.	
17		Main use fellings: selective, compulsory selective and voluntary selective fellings.	
18		Ecological essence of clearing of felling areas from residues and clearing of felling areas.	
19		Additional use of the forest.	
20		Forest fires.	
21		Measures to combat forest fires.	
22		Current state of forests and the ecological environment.	
23		Some rare, endangered plants.	

Recommended Sources

TEXTBOOK(S)

- G.S. Mammadov, K.S. Asadov. Forest ecology. Baku “Elm” -2010
- Yahyayev A.B. Fundamentals of forestry Baku,2011
- Yahyayev A.B. Procurement of forest materials. Baku,2012

- Prilipko A.I., Aliyev A.R. Greening of Azerbaijan. Baku, Az.SSR. Publishing house of the Academy of Sciences. 1967, 82 p.
- Amirov.F.A. Drought and the fight against it. Baku, 2007, 120 p.
- Balakishiyeva.Y.N. Collection of legal normative acts for forest sector workers. Baku, 2011, 336 p.
- Badalov.H.A, Ismayilov.N.I. Absheron greenery and its development prospects. Baku, 2015, 184 p.
- Dolkhanov.A, Dadashova.L, Garayeva.A. Fundamentals of sustainable management of Azerbaijani forests. Baku, 2012, 138 p.
- Amirov.F.A. The land that lost its green robe. Baku, 2004, 159 p.
- Gulisashvili V.V. Mountain forestry-M, 1956
- Melekhov I.S. Forestry-M 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

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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			6

MODULE HANDBOOK**Ecology bachelor program, Department of "Ecology and Environment".**

Course Unit Title	Ecological Monitoring	
Course Unit Code	İF-B20	
Type of Course Unit	Mandatory	
Level of Course Unit	3	
National Credits		
Number of ECTS Credits Allocated	5	
Theoretical (hour/week)	1	
Practice (hour/week)	1	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered		
Course Coordinator	Kh. Hasanov	
Name of Lecturer (s)	Kh. Hasanov	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani,Russian,English	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
<p>The method of ecological research occupies one of the main places in the educational process of the university. It would be impossible to implement the development and improvement of modern technology, industrial, pharmacological, food product quality control and the application of ecological research methods for the determination of heavy metals and toxic substances in environmental samples. To explain to students the role of ecological research methods used to determine the sources and levels of pollution of air, water and soil during environmental monitoring.</p>		
Objectives of the Course:		
<p>By studying this course, students will not only use classical methods in solving ecological problems, but also explain in detail the use of the properties of natural and industrial environmental samples such as conductivity, radiation absorption or emission, mass-to-charge ratios, etc. in inorganic, organic and biochemical quantitative analyses. Explain to students the changes that occur as a result of the interaction of the substance determined in the main instrumental methods with electromagnetic radiation. Provide students with detailed information about atomic absorption, atomic mass, inductively coupled plasma spectrometry, chromatographic analysis methods, chromatographic columns, supercritical fluid, chromatography and extraction.</p>		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Formation of ideas about the history of the development of the science of ecology, the subject and tasks of the science of "Ecology"; Formation of ideas about the mutual relationships between the influence of ecological factors on organisms and vice versa, the influence of organisms on the environment.	
2	Formation of ideas about global environmental problems.	
3	Formation of ideas about the modern ecological state of natural environments: air, water and soil.	
4	Formation of ideas about specially protected natural areas and the main	

	directions of international cooperation in the field of environmental protection.		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		The concept of ecological monitoring.	
2		Priority areas of ecological monitoring, technical and technological issues.	
3		Atmospheric monitoring.	
4		Monitoring of chemical pollution of the biosphere.	
5		Soil monitoring.	
6		Hydrosphere monitoring.	
7		Water quality monitoring programs.	
8		Existing ecological problems in oil and gas production areas.	
9		Ecological problems of the Caspian Sea and world water basins.	
10		Monitoring of the Caspian Sea.	

11		Biological monitoring.	
12		Ecological problems of rivers in Azerbaijan.	
13		Ecological problems of lakes in Azerbaijan.	
14		Ecological problems of soil in Azerbaijan.	
15		Ecological state and problems of the atmosphere in Azerbaijan.	
Recommended Sources			
TEXTBOOK(S)			
<ul style="list-style-type: none"> – Mammadov G.Sh, Khalilov M.Y. Ecology and environmental protection. Baku– 2005, 880 p. – Sultanov R.L., Sadiqova N.A. General ecology. Baku – 2010, 384 p. – Mammadov V., Yusifov E. Ecological management. Baku-2014, 428 p. – Sh.A.Ahmedov, Sh.I.Mammadova. Ecological monitoring, 2012, 120 p. – 5. E.Hetman.Fundamentals and Applications of Chromatography and Elektrophoretic Methods. Elsevier, Nevv York 1993- 496 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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

MODULE HANDBOOK**Ecology bachelor program, Department of "Ecology and Environment".**

Course Unit Title	Conservation of biodiversity	
Course Unit Code	İF-B21	
Type of Course Unit	Mandatory	
Level of Course Unit	2	
National Credits		
Number of ECTS Credits Allocated	6	
Theoretical (hour/week)	1	
Practice (hour/week)	1	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered	4	
Course Coordinator	Saida Hasanova	
Name of Lecturer (s)	Saida Hasanova	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani,English, Russian	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
The subject "Conservation of Biodiversity" provides an opportunity to obtain information about the protection of biological diversity and the elimination of dangerous factors affecting it.		
Objectives of the Course:		
During the course, students will learn in detail about the rapid consumption of natural resources, the increase in the number of factors threatening biodiversity and ecosystems, the degradation of ecosystems as a result of human activity, the extinction and sharp decline in the numbers of many fauna and flora species and genera, and other information.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	At the end of the course, students will acquire basic knowledge about the subject. The knowledge they gain will enable them to conduct research in the future to take serious measures to prevent the destruction of biological diversity, and to ensure its preservation and sustainable use.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Biodiversity, general understanding of its protection. Biological diversity in Azerbaijan.	
2		Ecosystem, natural balance and healthy ecosystems.	
3		Relationships between organisms.	
4		Structure of the ecosystem by food nature.	
5		Diversity and classification of living organisms. The world of viruses. The world of bacteria.	
6		Nadir, relict və endem növlər Azərbaycanın nadir və nəslə kəsilməkdə olan növləri. Azərbaycanın "Qırmızı Kitab"ı.	
7		Rare, relict and endemic species Rare and endangered species of Azerbaijan. The "Red Book" of Azerbaijan.	
8		Comparative anatomy. Biodiversity of organisms by skeletal system.	
9		Biodiversity of organisms by circulatory and respiratory systems.	
10		Biodiversity of organisms by nervous and excretory systems.	
11		Ecological groups of plants by their relationship to temperature. Ecological groups of plants by soil factors.	
12		Protection of the animal world State policy on the protection of biological diversity in Azerbaijan.	
13		Concept of strategic species. Key and indicator species.	
14		Specially protected natural areas National Parks, Sanctuaries, Reserves.	
15		Interaction between organisms and the environment.	

Recommended Sources

TEXTBOOK(S)

– Z.I.Akparov Biodiversity.

<ul style="list-style-type: none"> – Salimova N.A., Shahpalengova B.Sh., Babayev A.I. Engineer ecology. Baku-2012 – Mammadov G.Sh., Khalilov M.Y. Encyclopedic ecological dictionary. Baku-Elm-2008 – Mammadov T.S., Asadov H.H. “Plant ecology”. “Elm” publishing house, Baku-2014 – Asgarov A.A., Aliyev F.G., Huseynov E.M., Aliyev S.T. “Modern ecology”. Baku-2007 – Muradova E.O. Principles of democratic ecological education. Baku: Elm, 2009, 445 p. – Flint V.E. Strategy for the conservation of rare species. M.: Nauka, 2000, 328 p. – http://www.eco.gov.az/mus.php?id=1755 Archived 2010-09-21 at the Wayback Machine 			
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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			6

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and Environment”.

Course Unit Title	Sustainable management of natural resources.
Course Unit Code	IF-B22

Type of Course Unit	Mandatory	
Level of Course Unit	3	
National Credits		
Number of ECTS Credits Allocated	4	
Theoretical (hour/week)	1	
Practice (hour/week)	0.5	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered	5	
Course Coordinator	Ulviyya Karimova-Jafarova	
Name of Lecturer (s)	Ulviyya Karimova-Jafarova	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani, English, russian	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
<p>In the modern times, at the stage of development of mutual relations between society and nature, the main basis for solving numerous environmental problems is the balanced development of the economy as a whole, its ecologization and efficient management. In this regard, the discipline of "Sustainable Management of Natural Resources" has recently been formed and the demand for this field is increasing. The main goal of creating this new discipline is to determine the main directions of efficient use of nature and to determine ways to maintain ecological balance.</p>		
Objectives of the Course:		
<p>Sustainable management of natural resources is impossible without the participation of ecology and economics. These fields of science should be mastered not only by ecologists, but also by naturalists and specialists specializing in the use of nature. The efficient use of nature is of great importance in the development of production areas and in meeting the needs of society for consumer products. The involvement of natural resources in circulation is becoming more intensive depending on the richness of the labor resources of the territory and the level of development of the means of production. In different periods of development of society, the sphere of influence on natural resources has been sharply different from each other, depending on the level of development of the means of production. In recent years, the development of scientific and technological progress has further intensified the sphere of influence on natural resources.</p>		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	As a result of studying the subject, students acquire knowledge about the general regularities of natural and social phenomena, the problems of natural conditions and resources in the formation of production areas. At the same time, they learn about the regularities of the placement of natural resources on Earth and its regions, the classification and parameters of natural resources, and their economic assessment in the development of various production areas.	
2	Expectation of economic balance in the use of natural resources, food security, legal foundations of nature use, global trends, economic potential of energy resources. At the same time, they will acquire knowledge and skills in the field of assessment of biological resources, ecological essence of nature use,	

	international cooperation in the field of environmental protection during the use of natural resources.		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		Natural resources and general characteristics of their efficient use.	
2		Natural resources and prospects for their use	
3		Fuel and energy complexes.	
4		Mineral resources and their efficient use.	
5		Land resources, their efficient use and protection.	
6		Water resources, their efficient use and protection.	
7		Climate and recreational resources and ecological features of their use.	
8		Ecological problems of the use of bioresources.	
9		Ecological and economic significance and protection of forest resources.	

10		Socio-economic significance of reserves, national parks and sanctuaries and their role in nature protection.	
11		Resource security of agriculture.	
12		Food security.	
13		Socio-ecological problems of nature use.	
14		International cooperation in the use of natural resources.	
15		The role of international cooperation in the complex use of natural resources of Azerbaijan.	

Recommended Sources

TEXTBOOK(S)

Jafarova Raiba Mammadbagir gizi, Economics of Nature Use. Textbook. Baku – 2014, 286 p.

K.B.Bayramov. Economic and Ecological Problems of Nature Use, Textbook, BAKU – 2 011, 108 p.

J.Ismayilov, —Industrial Genetic Types of Mineral Raw Materials Deposits of Azerbaijan, Economic and Ecological Assessment, Baku – 2009. p. 158

A.A.Asgarov, —Environmental Protection and Use of Natural Resources, Baku – 1989. p. 249

G.S.Mammadov, M.Khalilov, —Ecology, Environment and Man, Baku – 2006. p. 607

G.Sh.Mammadov, —Ecological Assessment of Azerbaijani Lands, Baku – 1998. p. 280.

Mammadov Garib, Khalilov Mahmud, —Ecology and environmental protection, Baku-2005

N.I.Mahmudov, —Mineral resources and environment of Azerbaijan, Baku-2000.

Ecology and Sustainable Development. Fundamentals of General Ecology: textbook / A. T. Oralova, A. Zh. Auelbekova Karaganda State Technical University. - Karaganda: Publishing House, KarSTU, 2016. - 100 p.

Debelaya I. D. Rational Nature Management: textbook / I. D. Debelaya. - Khabarovsk: Publishing House of the Pacific State University, 2012. - 141 p.

Maslennikova I. S., Gorbunova V. V. Management of Environmental Safety and Rational Use of Natural Resources: Textbook. - St. Petersburg: SPbGIEU, 2007. - 497.

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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			4

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Civil defense
Course Unit Code	İF-B23
Type of Course Unit	Mandatory
Level of Course Unit	1
National Credits	
Number of ECTS Credits Allocated	
Theoretical (hour/week)	0.5
Practice (hour/week)	0.5
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	1
Course Coordinator	Elshan Amrahov
Name of Lecturer (s)	Elshan Amrahov
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 defense on its own, therefore, when developing a defense doctrine, two important aspects should be taken into account.

First, we must remember that the number of nuclear fronts available should be taken into account, the threat to this or that country, and this factor should be taken into account in defense 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 Civil Defense (CD) measures, they cannot be reduced to protecting the population, as well as national economic facilities, from weapons of mass destruction (WMD). The defense system faces the problem of protection from technogenic and natural disasters.

Objectives of the Course:

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

Emergency events that cause large material losses and human casualties (accidents at nuclear power plants, railways, enterprises using highly active substances, and frequent natural disasters, etc.) show that

the CD measures, especially for emergencies of peacetime origin, should be reviewed and evaluated. This issue is of greater importance in market relations and the transition period.
Civil defense of the Republic of Azerbaijan is a system of measures implemented by state authorities, legal entities and individuals in order to ensure the safety of the population and its territory in peacetime and wartime.

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 research methods, and relationship with other sciences of the subject of Civil Defense.	
2	Formation of ideas about the means of training in Civil Defense.	
3	Formation of ideas about the forms of organizing training in the subject of Civil Defense; Formation of ideas about the goals and objectives of the methodology of teaching the subject of Civil Defense, scientific research methods, and its relationship with other sciences;	
4	Formation of ideas about the forms of organization of MM training; Formation of ideas about the principles and training methods of MM training;	
5	Formation of the ability to make logical judgments, draw conclusions and justify them.	

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

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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		The concept of civil defense, its history, role, tasks and organization of training of the population in the field of protection from emergencies. Promotion of civil defense knowledge.	
2		Classification of emergency events.	
3		Understanding of weapons of mass destruction. Nuclear weapons and their damaging factors. Conventional means of destruction.	
4		Basic characteristics of radiation chemical reconnaissance and dosimetric devices and rules for their use.	
5		Rules for the use of personal protective equipment in emergency situations.	
6		Basic principles and methods of population protection in emergency situations. Collective protection devices.	
7		Evacuation of the population in emergency situations.	
8		Carrying out rescue and other urgent (Emergency and Disaster Management) work.	
<ul style="list-style-type: none"> – R.Guliyev, O.Salayev, J.Dadashov, T.Hamzabeyova “Civil Defense” Baku – 2022. – Methods and tactics of fighting natural fires. EuroFire © Iyil 2008. – Album of schemes on the subject “Civil Defense” Baku-2019. – Basic Safety Rules. Ministry of Emergency Situations Baku-2016. – Tural Amirkhanle. Primary fire extinguishing equipment. Baku 2004. – Malik Abbasov, Shamil Guliyev. First aid. Baku 2017. – Urgent first aid. Ministry of Emergency Situations Baku-2015. – Ojagov H.O. Safety of life activities in emergency situations. Baku 2010. – N.M.Hajiyev S.H.Mahmudov. Civil defense in the agricultural sector. Ganja - 2012. – Ojagov H.O. Elimination of the consequences of emergencies. Baku, 2009. – Ojagov H.O. Safety of life in emergencies (Textbook for higher education institutions). Chasioglu, Baku, 2002. – Ojagov H.O. Civil defense protective devices. 1993. – Ojagov H.O. Safety of life in emergencies (Civil defense). Baku, 2002 – Ojagov H.O. Civil defense protective devices. Baku, 2003 – Ojagov H.O. Emergency management. Baku, 2008 – Ojagov H.O., Danyalov Sh.D. Theoretical foundations of life safety. Baku, 2008. – “Civil defense”. Karimov Zabit Samad Baku 2013. – Karimov Z.S. Safety of life, labor protection. Baku, 2016. – R. Guliyev, O. Salayev, J. Dadashov, T. Hamzabeyova Civil defense Baku, 2022. – Major General Baba Salayev, Chief of the Academy of the Ministry of Emergency Situations of the Republic of Azerbaijan, Colonel Ilham Babashov, Lieutenant Colonel Rafael Mustafayev “The Book of the Rescuer” Baku, 2021. – Decree of the President of the Republic of Azerbaijan No. 1182 dated December 16, 2005. – Law of the Republic of Azerbaijan on MM, Baku, April 18, 1998. – Resolution of the Cabinet of Ministers on MM, No. 193, Baku, September 25, 1998. – Regulation No. 394 dated 19.04.2006 on the Ministry of Emergency Situations of the Republic 			

of Azerbaijan.			
– Regulation No. 511 dated 29.12.2006 on the Civil Defense Troops of the Ministry of Emergency Situations of the Republic of Azerbaijan.			
– Constitution of the Republic of Azerbaijan. Baku: Azernashr, 1996.			
– Law of the Republic of Azerbaijan on Civil Defense. Baku: Azernashr, 1999.			
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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			3

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and environment”.

Course Unit Title	Ecology and Environmental Protection
Course Unit Code	ATMF-B01
Type of Course Unit	Selected
Level of Course Unit	
National Credits	

Number of ECTS Credits Allocated	5	
Theoretical (hour/week)	1	
Practice (hour/week)	1	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered		
Course Coordinator	Ulkar Gadiyeva	
Name of Lecturer (s)	Ulkar Gadiyeva	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani,English	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
<p>Man's influence on nature is becoming stronger. Humans have positive and negative effects on vegetation. Negative effects include: deforestation, construction of roads, construction of water pools, burning of vegetation, etc. belongs to.</p> <p>People thoughtlessly spread the seeds of plants, cultivated wild plants, and transported plants from one country to another. This is a positive thing if done unconsciously. Conscious influence itself can be positive or negative. Acquisition of new species through artificial selection, enrichment of flora - these are positive things. Some plants are found in places where people live, under cultivation conditions.</p>		
Objectives of the Course: Studying the subject of plant ecology in depth, investigating the lifestyle features of plants, and how anthropogenic activity affects plants and animals		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	<p>Plant and animal ecology in the preparation of biologists and ecologists, nature It is very important to study. The study of plant ecology in an unfavorable environment in the elimination of factors, in the correct use of nature and the environment helps people in its protection.</p> <p>Plant ecology, the interaction of phytocenoses, plant associations with the habitat by learning, to solve many encountered problems, to increase the productivity of phytocenosis,</p> <p>teaches important tasks such as eliminating negative effects on plants and vegetation</p>	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		The subject of plant ecology, history of development	
2		Classification of environmental factors and regularities of influence	
3		Light is an environmental factor. The importance of light in the life of plants	
4		Ecological groups of plants according to their effect on light	
5		Reactions and adaptations of plants to illumination	
6		The role of the thermal factor in plant life	
7		Edaphic factors and their role in the life of plants and soil flora and fauna	
8		The importance of water in the life of plants	
9		Plant groups according to water regime requirements (Hydrophytes, Hygrophytes)	
10		Other plant groups according to their water needs. (Mesophytes, Xerophytes)	
11		Environmental effects of anthropogenic factors on plants	
12		Life forms as a form of adaptation of plants to environmental conditions and a systematic unit of plant ecology	
13		Vegetation belt in the mountains	
14		Ecological influence of zoogenic factors on plants	
15		Protection of flora	

Recommended Sources

TEXTBOOK(S)

- N.A. Sadygova. Plant ecology.
- Environmental legislation of the Republic of Azerbaijan (a collection of normative-legal acts). Baku: Qanun, 2006, 840 p.
- Zubrilov S.P., Ishchuk Yu.G., Kosovsky V.I. Environmental protection during ship operation. L.: Sudostroenie. 2009. 256 p.
- Korobkin, V.I., Peredelsky L.V. Ecology: [textbook for students of higher education institutions]. Rostov-on-Don: Phoenix, 2011. 602 p.
- Mavrishchev V.V. Fundamentals of ecology: textbook. Minsk: Higher. School, 2017, 447 p.
- Eurostat (2020), Greenhouse gas emissions from waste. <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20200123-1>.
- Suocheng Dong, Tong Kurt, Yuping Wu (2001), Municipal solid waste management in China: using commercial management to solve a growing problem. Utilities Policy, Vol.10, No.1, March 2001, pp.7-11. [https://doi.org/10.1016/S0957-1787\(02\)00011-5](https://doi.org/10.1016/S0957-1787(02)00011-5)

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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

1MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and environment”.

Course Unit Title	Ecology of the Caucasus	
Course Unit Code	ATMF -B01	
Type of Course Unit	Selected	
Level of Course Unit		
National Credits		
Number of ECTS Credits Allocated	5	
Theoretical (hour/week)	1	
Practice (hour/week)	1	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered	3	
Course Coordinator	Ulkar Gadiyeva	
Name of Lecturer (s)	Ulkar Gadiyeva	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description: The aim and objectives of the course are a comprehensive assessment of the current state of the ecosystems of the Caucasus ecoregion as a basis for the protection of biological diversity. In addition, the study of the geography of the Caucasus and the analysis of major ecological problems are among the main issues.		
Objectives of the Course: This course reflects information about the current state of the Caucasus region, creating a database of information about the physical and geographical position of the region, its socio-economic situation, and the territories it contains. The territory of the Caucasus, as a large physical and geographical country, is distinguished by its high biological and landscape diversity. The Caucasus is currently one of the most densely populated and developed parts of the region, which is associated with more favorable natural and climatic conditions.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Description of the composition and structure of the Caucasus region.	
2	Formation of ideas about its general physical geography.	
3	Formation of ideas about the ecology of the Caucasus.	
4	Information about the main factors affecting the nature of the Caucasus.	
5		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		The main goal and object of the subject of ecology of the Caucasus. Physical and geographical position and natural geographical features of the Caucasus region.	
2		Characteristics and ecological conditions of the countries of the Caucasus region. Geographical and ecological characteristics of the North Caucasus.	
3		Geographical and ecological characteristics of the Republic of Georgia and Armenia.	
4		Geographical characteristics of the territory of the Republic of Azerbaijan.	
5		Ecological characteristics of the territory of the Republic of Azerbaijan.	
6		Geographical and ecological characteristics of the mountainous areas of the Caucasus.	
7		Geographical and ecological characteristics of the mountainous areas of Azerbaijan.	
8		Geographical and ecological characteristics of the plain areas of the Caucasus.	
9		The role of natural factors in the degradation of landscapes in the Caucasus.	
10		Water resources and ecological state of the Republic of Azerbaijan.	
11		The structure of the Caspian Sea and its impact on the ecological conditions of the Caucasus region.	
12		Soil resources and ecological state of the Republic of Azerbaijan.	

13		Forest resources and ecological state of the Caucasus.	
14		Reserves of Azerbaijan, their role in landscape protection.	
15		National parks of Azerbaijan, their role in landscape protection.	

Recommended Sources TEXTBOOK(S)

- Museyibov M.A - Physical geography of Azerbaijan. B. 1998. p.400.
- Khalilov Sh.B. Ecogeographical problems of Azerbaijan. B. 2006. P. 160.
- Aliyev B.H., Aliyev I.N. Some problems of agriculture in Azerbaijan and ways to solve them, Baku, "Ziya-Nurlan", 2004, 527 p.
- Mammadov G.Sh. Land resources of Azerbaijan. - Baku, 2002. P 132.
- Malkov F.N. Physical geography of the CIS. European part. Caucasus, Baku, 1990, 362 p.
- Ataev Z.V., Bratkov V.V. Mountain landscapes of the North Caucasus. Zhurn. Phys.Geogr.i Geomorf. 2013, pp.146-152.
- Bratkov V.V., Ataev Z.V. Geographical features of landscapes of the northern slope of the Greater Caucasus. Bulletin of the Dagestan State Pedagogical University. Natural and exact sciences. 2011. No. 2. pp. 81-86.
- Ataev Z.V., Bairamkulova B.O., Bekmurzaeva L.R. Features of modern climatic conditions of mountain-basin landscapes of the northern slope of the Greater Caucasus // Natural and technical sciences. 2009. No. 4. pp. 237-240.
- Ataev Z.V., Bratkov V.V. Modern problems of conservation of biological and landscape diversity of the North Caucasus ecological region // South of Russia: Ecology, development. 2009. No. 4. P. 186-192.
- Atayev Z.V., Bratkov V.V. Landscape diversity of specially protected natural territories of the Russian Caucasus // Geographical Bulletin. 2011. No. 1. P. 4-10.
- Atayev Z.V., Bratkov V.V. Representativeness of the network of specially protected natural territories to the landscape diversity of the North Caucasus // Actual problems of humanitarian and natural sciences. 2011. No. 10. P. 272-276.
- Bratkov V.V., Atayev Z.V. Geographical features of the influence of climatic conditions on the mountain-basin landscapes of the northern slope of the Greater Caucasus // South of Russia: ecology, development. 2009. No. 4. P. 192–195.
- Physical Geography of the USSR, F.N. Milkov, N.A. Gvozdetzky. M. Mysl. 1976. 410 p.
- Milanovsky E.E., Khain V.E. Geological Structure of the Caucasus / Ed. M.V. Muratov — M.: Moscow University Publishing House, 1963. —357 p.
- Gvozdetzky N.A. The Caucasus. Nature Essays. M.: Geografiz, 1963. 264 p.
- Gvozdetzky N.A. Physical Geography of the Caucasus. General Part. The Greater Caucasus. Issue 1. M.: Moscow University Publishing House, 1954. 208 p.
- Prospects of the Caucasus Environment / Ed. N.L. Beruchashvili et al. UNEP, GRID. Tbilisi, 2002. 98 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			
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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and environment".

Course Unit Title	Flora and fauna of Azerbaijan
Course Unit Code	ATMF-BO1
Type of Course Unit	Selected
Level of Course Unit	1
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	1
Course Coordinator	Govhar Aydamirova
Name of Lecturer (s)	Govhar Aydamirova
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-
Course description:	
During the teaching of the subject, knowledge such as the taxonomic composition of the plant and animal world, the concept of flora and fauna and the history of its study, ecology, plants and animals used by people for various purposes, rare and endangered plant and animal resources, and their protection are imparted to students. The subject is taught by explaining its relationship with other subjects.	
Objectives of the Course: The main goal of teaching the subject is to provide students with information about the flora and fauna of Azerbaijan, as well as its history, the total number of distributed species, as	

well as the study of their resources, their use, the protection of rare species and, in this regard, ensuring ecological safety and preserving biological diversity.			
Learning Outcomes			
At the end of the course the student will be able to			Assessment
1	To provide students with information about the protection and efficient use of the plant world, its habitat, and the vegetation of Azerbaijan.		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		Understanding of flora and the goals and objectives of its study.	
2		Teaching about the biosphere, protection of the plant world of Azerbaijan.	
3		Flora spectrum and plant types of Azerbaijan.	
4		Fauna of Azerbaijan.	
5		Forests of Azerbaijan, their floristic composition and protection.	
6		Physical and geographical characteristics of Azerbaijan and	

		formation of its fauna.	
7		Relict and endemic plants of Azerbaijan.	
8		Medicinal plants of Azerbaijan.	
9		Species of plants and animals included in the Red Book.	
10		Flora and fauna of Shusha.	
11		Classification of old trees found in the flora of Azerbaijan.	
12		State reserves.	
13		Sanctuaries of Azerbaijan.	
14		National parks.	
15		The role of forests in protecting the ecosystem.	

Recommended Sources TEXTBOOK(S)

- Mammadov G.Sh., Khalilov M. Forests of Azerbaijan. Baku, Science, 202.472 p.
- Gurbanov M.R., Isgander E.O. Bioecology, reproduction and protection of rare woody plants of Azerbaijan Baku, Education-Science, 2015, 275 p.
- Mammadov T.S., Isgander E.O., Talibov T.H. Rare trees and shrubs of Azerbaijan Baku, Science, 2014. 376 p.
- Mustafayev G.T., Sadigova N.A. Birds of Azerbaijan, Chagoglu, 2005.
- Mustafayev G.T., Sadigova N.A. Ecology of vertebrates, Baku University, 2011.
- Jafarova S.G. Ecology of amphibians, Baku, 2014.
- Jafarova S.G. Ecology of reptiles, Baku, 2010.
- Red Book of Azerbaijan, 1989, 2013.
- Guliyev V.Sh. Plant world of Azerbaijan and its protection. Azerbaijan State Publishing House, Baku.1984.
- Red Book of Nakhchivan Autonomous Republic, 2010.
- Prilipko L.I. Vegetation cover of Azerbaijan. Baku. Elm, 1970.
- Flora of Azerbaijan. In 8 volumes. Baku: Academy of Sciences of Azerbaijan. SSR, 1950-1961.
- Grossgeim A.A. Vegetation richness of the Caucasus, Moscow 1952.

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	240		
Total Workload/30(h)	240/30		
ECTS Credit of the Course	5		

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and environment".

Course Unit Title	Hydrology
Course Unit Code	ATMF-B02
Type of Course Unit	Mandatory
Level of Course Unit	2
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	1.5
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	4
Course Coordinator	Aruz Mikayilov
Name of Lecturer (s)	Aruz Mikayilov
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-

Course description: Hydrology is the scientific study of the water cycle on Earth, the factors involved in this cycle, and the processes that occur as a result of their influence. This field mainly studies the movement of water in nature, its various forms (rain, snow, ice, groundwater, rivers, lakes, oceans), and water resource management. Hydrology is also closely related to various fields such as soil conservation, agriculture, urban planning, and ecology. Specialists working in the field of hydrology make decisions regarding the efficient use and conservation of water resources by understanding the various changes in the nature of water and its impact on ecosystems.

The study of this science is vital for water resource management, disaster prevention (such as floods and droughts), optimal use of water for agriculture, and many other important areas.

Objectives of the Course: The main objective of the hydrology subject is to make students understand the water cycle in nature, the different forms of water, and how these processes affect ecosystems and human activities. The subject provides students with theoretical and practical knowledge in the field of water resource management, protection, and sustainable use.

The objectives of this subject are as follows:

Study of the water cycle: Understanding the stages of the water cycle (evaporation, condensation, precipitation, runoff, and groundwater) and the role of these processes in nature. Analysis of hydrological processes: Understanding and analyzing basic hydrological processes such as precipitation, runoff,

evaporation, and groundwater.
 Water resources management: Acquiring the knowledge necessary for the management, protection, and sustainable use of water resources.
 Water quality assessment: Learning how to measure and analyze water quality and prevent pollution.
 Climate change impact assessment: Understanding the effects of climate change on the water cycle and water resources. Disaster Management: Causes of floods, droughts and other water-related natural disasters and ways to combat them.
 Ecological Aspects: The impact of water resources on ecosystems and the protection of aquatic ecosystems.
 Teaching this subject helps students understand current problems related to water resources and ways to solve them, as well as to become more knowledgeable about the issues of sustainable use and protection of water resources in the future.

Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Hidrologiya fənninin əsas məqsədi tələbələrə suyun təbiətdəki dövrənini, The main objective of the hydrology subject is to make students understand the cycle of water in nature, its various forms, and how hydrological processes occur in nature. This subject provides students with theoretical and practical knowledge on the analysis, protection, and sustainable use of water resources. At the same time, it helps them understand the movement of water in nature and its impact on ecosystems and human life.	
2	The subject of hydrology aims to provide students with the following skills: Understand the main stages of the water cycle and the relationships between these stages.	
3	Analyze hydrological processes and phenomena such as precipitation, evaporation, runoff, and groundwater. Learn about the management, conservation, and sustainable use of water resources.	
4	To master approaches to practical issues in the field of hydrology and various technical methods.	
5	To understand the relationships between climate change and water resources and to propose solutions to these issues.	

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

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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly	

	processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Concept of Hydrology, Hydrological Cycle, Basic Principles of Hydrology.	
2		Water Balance and Energy Balance in the Hydrological Cycle.	
3		Precipitation, Generation, Measurement of Precipitation.	
4		Analysis of Precipitation Records.	
5		Evaporation.	
6		Evaporation-Water Balance.	
7		Infiltration.	
8		Infiltration Rate, Infiltration Indices.	
9		Groundwater.	
10		Flow Measurements and Data Analysis.	
11		Analysis of Flow Records.	
12		Precipitation-Flow Relationships.	
13		Hydrograph Analysis.	
14		Flood Analysis.	
15		Probability Theory and Application of Statistics in Hydrology.	

Recommended Sources

TEXTBOOK(S)

- Imanov F.A., Mammadov V.A., Abdullayev I.M. Hydrology. Baku, "MBM", 2014. - 564 p.
- Mammadov M.A., Imanov F.A. General hydrology. Baku, Baku University Publishing House. 2003-230 p.
- Kazimov S.M., Safarov A.V., Tagiyev I.I., Abasov M.M. General Hydrogeology. Textbook for higher education institutions, - Baku: ADNA Publishing House, 2007, 155 p.
- Imanov F.A. Statistical methods in hydrometeorology. Baku, 2011, 272 p.
- Imanov F.A. Applied hydrology. Baku, 2010.-232 p.
- Imanov F.A. Hydrological calculations. Baku, 2011.-263 p.
- Imanov F.A., Alakbarov A.B. Modern changes and integrated management of water resources of Azerbaijan. – Baku: Mutarcim, 2017. – 352 p.
- Imanov F.A., Mammadov V.A., Abdullayev I.M. Hydrology. Baku, "MBM", 2014. - 564 p.
- Mammadov M.A., Imanov F.A. General hydrology. Baku, Baku University Publishing House. 2003-230 p.

<ul style="list-style-type: none"> – Kazimov S.M., Safarov A.V., Tagiyev I.I., Abasov M.M. General Hydrogeology. Textbook for higher schools, – Baku: ADNA Publishing House, 2007, 155 p. – Imanov F.A. Statistical methods in hydrometeorology. Baku, 2011, 272 p. – Imanov F.A. Applied hydrology. Baku, 2010.-232 p. – Imanov F.A. Hydrological calculations. Baku, 2011.-263 p. – Imanov F.A., Alakbarov A.B. Modern changes and integrated management of water resources of Azerbaijan. – Baku: Mutarcim, 2017. – 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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			6

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and environment”.

Course Unit Title	Environmental control and restoration
Course Unit Code	ATMF-B02
Type of Course Unit	Selected
Level of Course Unit	1

National Credits		
Number of ECTS Credits Allocated		6
Theoretical (hour/week)		1.5
Practice (hour/week)		1
Laboratory (hour/week)		
Year of Study		1
Semester when the course unit is delivered		1
Course Coordinator		Masuma Piriyeva
Name of Lecturer (s)		Masuma Piriyeva
Name of Assistant (s)		-
Mode of Delivery		Face to face
Language of Instruction		Azerbaijan
Prerequisites		-
Recommended Optional Program Components		-
<p>Course description: The subject "Environmental Control and Restoration" provides students with theoretical and practical knowledge related to modern approaches in the field of environmental protection. The subject examines the sources of environmental problems, anthropogenic impacts, environmental monitoring methods and environmental assessment. The main focus is on methods of control over the atmosphere, water, soil and biodiversity, as well as ecosystem restoration and rehabilitation technologies. The subject provides students with knowledge and skills in areas such as sustainable environmental management, pollution elimination, land reclamation, regenerative forestry and the return of technogenically degraded areas to ecology. In addition, international environmental standards and legislative issues in environmental protection are also touched upon.</p>		
<p>Objectives of the Course: To teach students modern approaches and practical skills in environmental monitoring, pollution remediation, and restoration of degraded ecosystems.</p>		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Will be able to explain methods of monitoring environmental components; Will be able to analyze the objectives and application areas of ecological monitoring;	
2	Will be able to apply methods for measuring pollution in the atmosphere, water, soil and biodiversity; Will be able to select appropriate technologies and approaches for the restoration of degraded areas.	
3	Will be able to plan measures for hazardous waste management.	
4	Will understand the difference between engineering and biological methods in ecosystem restoration;	
5	Will be able to apply the local and international legislative framework for environmental protection.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Objectives and tasks of environmental control.	
2		Theoretical foundations of ecological monitoring.	
3		Atmospheric pollution and control methods.	
4		Air quality assessment and modeling.	
5		Water resources monitoring and purification methods.	
6		Soil pollution and reclamation methods.	
7		Biodiversity and biological monitoring.	
8		Assessment of ecosystem services.	
9		Impact of anthropogenic impacts on the environment.	
10		Assessment of the consequences of technogenic accidents.	
11		Control of radioactive pollution.	
12		Waste classification and management.	
13		Disposal of solid, liquid and gaseous waste.	
14		Land reclamation and restoration methods.	
15		Restoration and protection of forest ecosystems.	
16		Basic principles of restorative ecology.	
17		Ecological restoration strategies in urban areas.	
18		Environmental management systems and environmental audit.	
19		International environmental agreements and protocols.	
20		National legislation on environmental protection.	

21		Ecological ethical behavior and public control.	
22		Environmental legislation and international conventions.	
23		Sustainable development and environmental protection.	
Recommended Sources TEXTBOOK(S)			
<ul style="list-style-type: none"> – Huseynov A.M. – Environmental protection and ecological safety, Baku: Education, 2019. – Gasimov R.N. – Fundamentals of ecological monitoring, Baku: BSU, 2020. – Aliyeva G.Sh. – Soil rehabilitation and restoration technologies, Baku: Ecology NPM, 2017. – Cunningham W.P. – Environmental Science: A Global Concern, McGraw-Hill, 2015 – Hester R.E., Harrison R.M. – Environmental Monitoring, Royal Society of Chemistry, 2005 – UNEP, FAO, WHO, IPCC materials and reports (online) 			
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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			6

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and environment”.

Course Unit Title	Ecological problems of the oil industry
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Course Unit Code	ATMF-B02	
Type of Course Unit	Mandatory	
Level of Course Unit		
National Credits		
Number of ECTS Credits Allocated	6	
Theoretical (hour/week)	1.5	
Practice (hour/week)	1	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered		
Course Coordinator	Ulviyya Karimova-Jafarova	
Name of Lecturer (s)	Ulviyya Karimova-Jafarova	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
In order to achieve the goal set during the teaching of the subject, the following issues are intended to be solved:		
To investigate the current state of the problem of environmental pollution by petroleum hydrocarbons;		
To investigate the composition, physical and chemical properties of Azerbaijani oil;		
To investigate the chemical and biochemical processes occurring between petroleum hydrocarbons and environmental components;		
To investigate the negative impacts on soil, water and air basins during the exploration of oil wells, drilling and development of wells, and oil transportation, and to take measures to reduce the negative impacts;		
To improve the operation of treatment facilities in order to reduce the negative impacts on the environment of waste gases generated during the production and recycling of petroleum products.		
Objectives of the Course: The main task of the course is to reduce the negative impact of waste gases generated during the exploration, drilling, exploitation of oil wells, and oil refining processes on the environment, and to develop scientifically substantiated proposals. In our republic, the study of the solution of environmental problems, the causes of the problem, the directions for its elimination, the development and implementation of specific measures in this direction are of great practical importance.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	As a result of studying the subject, students will acquire the following knowledge: Exploration of oil fields, drilling and exploitation of wells, the negative impact of methods, technologies and reagents used in these processes on environmental factors; Preparation for the main technological processes of oil refining; oil dehydration and desalination; atmospheric and vacuum distillation processes;	
2	Destructive processing of oil (cracking, hydrogenation, isomerization); purification of transparent (light) products; extraction and purification of oils; Methods of neutralizing waste generated in the oil production and refining industry;	

	Methods of organizing and conducting production, environmental monitoring, engineering control works at oil production and refining industrial enterprises;	
3	Consumption of production water and volume of wastewater, methods of deep oil purification; Dependence of the amount of various pollutants in wastewater on the quality of oil processing, its processing technology and the quality of the final product of production;	
4	Accidents that may occur in the processes of transporting oil through pipelines and transporting oil and oil products by tankers; Opportunities for expanding relations with international organizations and developed countries in the field of environmental protection;	
5	They will gain experience in strengthening environmental advocacy and awareness among the population.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		
Course Contents		
Week	Chapter	Topics
		Exam

1		History of the development of the oil industry in Azerbaijan.	
2		Classification of oil and oil products. Hydrocarbon composition of crude oil and its properties.	
3		Exploration and exploration of oil and gas fields. Environmental protection in exploration and exploration works.	
4		Environmental protection in drilling of oil and gas wells.	
5		General information about drilling fluids. Materials used in the preparation of drilling fluids and the impact of chemical reagents on the environment.	
6		Methods for cleaning and neutralizing wastewater generated in the drilling process.	
7		Characteristics of waste discharged into the environment during the oil and gas extraction process.	
8		Environmental problems arising during the storage and transportation of crude oil and oil products.	
9		Environmental problems arising during the preparation and sorting of oil for processing.	
10		Physical processing of crude oil and environmental problems arising during this time.	
11		Environmental problems arising from thermal processing processes of oil.	
12		Environmental problems arising from thermochemical processing processes of oil.	
13		Environmental problems arising during the production of petroleum oils.	
14		Environmental problems arising from the production of bitumen.	
15		Environmental problems arising during the production of petroleum acids.	
16		Protection of the atmosphere from harmful wastes of oil and gas processing and the oil industry.	
17		Protection of the hydrosphere from harmful wastes of oil and gas processing and the oil industry.	
18		Protection of the lithosphere from wastes of oil and gas processing and the petrochemical industry.	
19		Management of solid production wastes received in the oil production and refining industry.	
20		Economic assessment of the damage caused by environmental pollution in the oil and gas industry.	
21		Ecological monitoring of oil and gas production and oil refining industry enterprises.	
22		Environmental policy of SOCAR.	
<p>Recommended Sources</p> <p>TEXTBOOK(S)</p> <ul style="list-style-type: none"> – G.I.Safarov, A.S.Mammadov “Technology of oil and gas processing” 464 p., 2000. – A.Novruzov “General chemical technology and industrial ecology” 384 p. 1991. – A.M. Maharramov, M.R.Bayramov, I.G.Mammadov “General chemical technology” 308 p., 2011. – Kh. Mirzajanzade. Oil. Maarif Publishing House, Baku, 1981. 100 p. 			

- E.E.Ramazanova, H.G.Ismayilova. Hydrocarbon losses and eco-economic problems, Monograph, Baku-2018, 230 p.
- N.A. Verdizade, M.H. Isgandarov “Fundamentals of ecology and nature protection” 232 p., 2008.
- Selimova N.A. New ecologically safe processes. Textbook, Azerbaijan State Oil Academy. Baku: ADNA, 2009, 162 p.
- N.A. Salimova, B.Sh. Shahpalengova, A. Babayev “Engineer ecology” 634 p., 2012.
- M.B. Polozov. Study guide "Ecology of oil and gas producing complex". - Izhevsk: Publishing house "Udmurt University", 2012. -174 p.
- Bulatov A.N. Environmental protection in the oil and gas producing industry. M. Nedra, 1999, 240 p.
- Bunchuk V.A. Transport and storage of oil, oil products and gas. M. Nedra, 1977, 366 p.
- Gumbatov G.G. Environmental protection issues at oil and gas producing enterprises. Baku, Elm, 1999,87 p.
- Kuzmina R.I., Chudakova E.V., Vetrova T.K., Karpachev B.A. Oil and gas processing technology - Saratov: Publishing house Nauchnaya kniga, 2010. - 254 p.
- Kuznetsova T.O. Environmental safety in the oil and gas industry: a textbook / T.O. Kuznetsova, E.P. Varavina. - Kh.: NTU "KhPI", 2013. - 77 p.
- Siyavush Karaev, Karam Shykhaliyev. Environmental problems of transportation of oil and oil products and new methods of cleaning the water surface from oil and oil products. Hannover, EAEN, 2014, 44 p.
- Detsuk V.S. Assessment of damage from environmental pollution: a training and methodological manual / V.S. Detsuk; Ministry of Transport and Communications of the Republic of Belarus, Belarusian State University of Transport - Gomel: BelSUT, 2015. - 50 p.
- A.S. Akhmetov “Deep oil and gas processing technology” 672 p. UFA 2002
- A.S. Akhmetov, M.Kh. Ishmiyarov, A.P. Verevkin, E.S. Dokugaev, Yu.M. Malyshev “Technology, economics and automation of oil and gas refining processes” 735 p., Moscow, Khimiya 2005
- J.M.Mahmudov “Technology of production areas and industrial ecology”, 2006
- Sh.Ahmadov, N.Muradov. “Ecology. Atmospheric pollution” 84 pages, 2008
- Rustamov M.I. Environmental problems of the Earth and alternative energy sources / M.I.Rustamov, V.M. Abbasov, T.A.Mamedova, N.N.Piriev. - Baku: ELM, 2008,

Assessment

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

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

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

ECTS allocated based on Student Workload

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	240		
Total Workload/30(h)	240/30		
ECTS Credit of the Course	6		

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and Environment”.

Course Unit Title	Ecology of the Caspian Sea
Course Unit Code	ATMF-B03
Type of Course Unit	Selection
Level of Course Unit	2
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	4
Course Coordinator	Ulkar Gadiyeva
Name of Lecturer (s)	Ulkar Gadiyeva
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani, English, Russian
Prerequisites	-
Recommended Optional Program Components	-
Course description:	
<p>The main task of the course is to study the current ecological state of the Caspian Sea and prepare scientifically substantiated proposals. Thus, solving ecological problems in our republic, studying its general theoretical methodological foundations and directions, determining the causes of the problem, directions for its elimination, and developing and implementing specific measures in this direction are of great practical importance.</p>	
Objectives of the Course:	
<p>In order to achieve the goal set during the teaching of the subject, the following issues are intended to be addressed:</p> <ul style="list-style-type: none"> – To study the history of the formation of the Caspian Sea, the geographical and geological factors affecting it; – To study the geographical indicators and bioresources of the Caspian Sea; – To study the current state of the problem of pollution of the Caspian Sea; – To study the negative effects of oil, oil refining products and their waste on the Caspian Sea and to take measures to reduce the negative effects; – To reduce the negative effects of various pollutants (solid, liquid) on the Caspian Sea, improve the operation of treatment facilities, etc. 	

Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	The causes of pollution of the Caspian Sea are various: Pollutants coming through rivers flowing into the Caspian Sea; Pollutants coming from cities and industrial facilities located in the coastal zone; Pollution related to oil production and transportation at sea; Pollution from underwater sources in the coastal zone as a result of the rise in the level of the Caspian Sea;	
2	Leakage of oil and oil products during transportation and transportation of floating vehicles (tankers). Part of the fertilizers used in agricultural fields is washed away by precipitation and irrigation water and discharged into the sea through rivers and canals.	
3	To provide students with extensive information on the main polluting factors in shipping, such as ballast water, domestic sewage and groundwater (oil-rich formation waters), waste generated during ship repairs in shipyards, etc., and to form basic and new knowledge in this field.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		A brief history of the formation of the Caspian Sea	
2		Physical geographical conditions of the Caspian Sea.	
3		The level of the Caspian Sea and the factors affecting it	
4		Biological resources of the Caspian Sea	
5		Protection of the biodiversity of the Caspian Sea	
6		Ecological aspects of the socio-economic situation of the Caspian countries.	
7		Air quality and environmental status of the atmosphere from the Caspian region.	
8		Impact of agriculture on the ecological situation of the Caspian Sea.	
9		The impact of the ecological situation of the Caspian Sea on fisheries.	
10		Hydrocarbon resources of the Caspian Sea: environmental problems arising during their exploitation and use.	
11		Recreational resources of the Caspian Sea.	
12		Transport development in the Caspian region and its impact on the environment.	
13		Development of coastal areas of the Caspian Sea and increase of anthropogenic influence.	
14		The role of interstate agreements in the protection of the ecological situation of the Caspian Sea.	
15		The problem of the legal status of the Caspian Sea and the solution of environmental issues.	
<ul style="list-style-type: none"> – Recommended Sources TEXTBOOK(S) – Ch. Ismayilov. Ecology of the Caspian Sea and coastal areas, "Ayna Matbu Evi", 2005, 128 pages. – Panin G.N., Mamedov R.M., Mitrofanov I.V. The current state of the Caspian Sea. Moscow: Nauka, 2005, 356 p. – T. Baharchi, V. Mehdiyeva. Environmental problems of the Caspian Sea and Absheron, their solutions. Textbook. Baku-2012. – Mamedov R.M. 2000. Variability of hydrophysical fields and distribution of pollutants in the Caspian Sea, Baku. Izd. "Elm", 185 p. – Gasimov, L. Rogers, F. Askerov. Ecological concept of the Caspian Sea, Science Publishing House, Baku, 1998, 96 p. – Мамедов Р. Formation of international legal status of the Caspian Sea in the post-Soviet period / R. Mamedov// Central Asia and the Caucasus. 2 (8) 2000. – Mamedov R.M. 2002. Model of the oil pollution transport process in the southwestern part of the Caspian Sea, 7-th International Conference Gas in Marine Sediments, Baki, October 7-12, p.139-142. – Caspian National Emergency Response Centre, 2001, Report on the collection of information on vulnerable areas as part of the national and regional Oil Spill Response Plan, Global Environment Facility - United Nations Development Programme. – Mitrofanov, I. V., 2001, Review and assessment of the impact on the fauna of invertebrates, fish, birds and marine mammals in the Kazakhstan part of the Caspian Sea in the form of heavy metals, pesticides and hydrocarbons, Caspian Environmental Program. 			
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		240
Total Workload/30(h)		240/30
ECTS Credit of the Course		6

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Water and land ecosystems.
Course Unit Code	ATMF-B03
Type of Course Unit	Selection
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Ulviyya Karimova-Jafarova
Name of Lecturer (s)	Ulviyya Karimova-Jafarova
Name of Assistant (s)	-

Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
<p>The term "ecosystem" was first introduced into science in 1935 by the English botanist Arthur George Tansley. The term refers to any unit (in a very different volume) including all organisms (i.e. biocenosis) in a certain area (biotope) and its interaction with the physical environment within the system, indicating a certain precise trophic structure of energy flow, species diversity and material circulation (or exchange between biotic and abiotic environments). Simply put, any set of organic and inorganic components that metabolize substances in the biosphere is called an ecosystem. According to Tansley, an ecosystem is the main unit of nature on the Earth's surface. He considers the ecosystem as a complete unit of the biotope and biocenosis.</p> <p>During the teaching of the subject, students will gain knowledge about the energy of ecosystems, dynamic processes occurring in them, environmental factors affecting ecosystems, terrestrial, marine, freshwater ecosystems, as well as anthropogenic ecosystems created by humans. The protection of ecosystems will be studied in both natural and anthropogenic ecosystems. Ways to solve the problem will be shown.</p>		
Objectives of the Course:		
<p>The main goal of teaching the subject is to study ecosystems and the general laws that positively affect or limit their development. Thus, the extent to which they will professionally solve the problem of minimizing or eliminating negative aspects of the use of nature in the future directly depends on their level of knowledge of the structure and laws of nature. The exploitation of natural resources and ecological systems without knowing and taking into account the mutual effects of technical progress and the organic world inevitably leads to irreversible negative processes. In the past and present, ill-considered attempts by man to change nature contrary to its laws have essentially created problems called ecological crises. In this regard, the goal is to teach students knowledge about ecosystems and their protection measures.</p>		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Theoretical justification of processes occurring in ecosystems.	
2	Classification of terrestrial and aquatic ecosystems.	
3	Changes occurring in existing ecosystems and the impact of ecological problems on them.	
4	Methods of protecting ecosystems, etc.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing	

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

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

Course Contents

Week	Chapter	Topics	Exam
1		Ecological systems. The concept of ecosystems.	
2		Classification of natural ecosystems of the biosphere according to landscapes.	
3		Freshwater ecosystems.	
4		Marine ecosystems.	
5		Brackish water ecosystems.	
6		Groundwater ecosystems.	
7		Man-made water ecosystems.	
8		Functions of water ecosystems.	
9		Freshwater ecosystems of Azerbaijan: problems and prospects.	
10		Biological resources of the Caspian Sea and their protection.	
11		Terrestrial ecosystems located in the tundra, taiga and temperate zones.	
12		Terrestrial ecosystems of desert, semi-desert, semi-desert and desert zones.	
13		Terrestrial ecosystems of subtropical and tropical zones.	
14		Agricultural ecosystems (agroecosystems).	
15		Industrial-urban ecosystems.	

Recommended Sources

TEXTBOOK(S)

- V.I.Korobkin, L.V.Peredelski. Ecology. Textbook (translated from Russian). Baku: "İqtisad Universiteti" Publishing House, 2013. - 434 p.
- Mammadov G.Sh., Khalilov M.Y. «Ecology and environmental protection» Baku, «Elm» publishing house – 2005, 880 p. T.A.Khalilov, «Fundamentals of ecology and environmental protection», Baku, «MBM-R», 2009, 232 p.
- F.Akiyev, R.Huseynov, G.Gurbanov, R. Tagiyev. Chemistry, ecology and health. Ganja, Elm, 2016. 185 p.

- Korobkin V. I., Peredelsky L. V. K66 Ecology. 5th ed., suppl. and revised. - Rostov n / D: Phoenix Publishing House, 2003. - 576 p. (Series "Higher Education".)
- Khlebnikova T. D., Khamidullina I. V., Sayapova V. V. 10 Lectures on Ecology: textbook. /T. D. Khlebnikova, I. V. Khamidullina, V. V. Sayapova - Ufa, 2016. - 79 p.
- Mavrishchev V. V. Fundamentals of Ecology: textbook. Minsk: Higher. School, 2017, 447 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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			6

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and Environment”.

Course Unit Title	Ecosystems, their protection.
Course Unit Code	ATMF-B03
Type of Course Unit	Selection
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6

Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Ulviyya Karimova-Jafarova
Name of Lecturer (s)	Ulviyya Karimova-Jafarova
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-
Course description:	
<p>The term "ecosystem" was first introduced into science in 1935 by the English botanist Arthur George Tansley. The term refers to any unit (in a very different volume) including all organisms (i.e. biocenosis) in a certain area (biotope) and its interaction with the physical environment within the system, indicating a certain precise trophic structure of energy flow, species diversity and material circulation (or exchange between biotic and abiotic environments). Simply put, any set of organic and inorganic components that metabolize substances in the biosphere is called an ecosystem. According to Tansley, an ecosystem is the main unit of nature on the Earth's surface. He considers the ecosystem as a complete unit of the biotope and biocenosis.</p> <p>During the teaching of the subject, students will gain knowledge about the energy of ecosystems, dynamic processes occurring in them, environmental factors affecting ecosystems, terrestrial, marine, freshwater ecosystems, as well as anthropogenic ecosystems created by humans. The protection of ecosystems will be studied in both natural and anthropogenic ecosystems. Ways to solve the problem will be shown.</p>	
Objectives of the Course:	
<p>The main goal of teaching the subject is to study ecosystems and the general laws that positively affect or limit their development. Thus, the extent to which they will professionally solve the problem of minimizing or eliminating negative aspects of the use of nature in the future directly depends on their level of knowledge of the structure and laws of nature. The exploitation of natural resources and ecological systems without knowing and taking into account the mutual effects of technical progress and the organic world inevitably leads to irreversible negative processes. In the past and present, ill-considered attempts by man to change nature contrary to its laws have essentially created problems called ecological crises. In this regard, the goal is to teach students knowledge about ecosystems and their protection measures.</p>	
Learning Outcomes	
At the end of the course the student will be able to	
1	Theoretical justification of processes occurring in ecosystems.
2	Classification of terrestrial and aquatic ecosystems.
3	Changes occurring in existing ecosystems and the impact of ecological problems on them.
4	Methods of protecting ecosystems, etc.
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz	
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Ecological systems. The concept of ecosystems.	
2		Homeostatic ecosystems.	
3		Ecosystem energy.	
4		Ecosystem biological productivity.	
5		Ecosystem dynamics.	
6		Classification of natural ecosystems of the biosphere according to landscapes.	
7		Terrestrial biomes (ecosystems).	
8		Freshwater ecosystems.	
9		Marine ecosystems.	
10		The biosphere as a whole global ecosystem.	
11		Man and ecosystems.	
12		Agricultural ecosystems (agroecosystems).	
13		Industrial-urban ecosystems.	
14		Freshwater ecosystems of Azerbaijan: problems and prospects.	
15		Biological resources of the Caspian Sea and their protection.	

Recommended Sources TEXTBOOK(S)

- Ch. Ismayilov. Ecology of the Caspian Sea and coastal areas, "Ayna Matbu Evi", 2005, 128 pages.
- Panin G.N., Mamedov R.M., Mitrofanov I.V. The current state of the Caspian Sea. Moscow: Nauka, 2005, 356 p.
- T. Baharchi, V. Mehdiyeva. Environmental problems of the Caspian Sea and Absheron, their solutions. Textbook. Baku-2012.
- Mamedov R.M. 2000. Variability of hydrophysical fields and distribution of pollutants in the Caspian Sea, Baku. Izd. "Elm", 185 p.
- Gasimov, L. Rogers, F. Askerov. Ecological concept of the Caspian Sea, Science Publishing House, Baku, 1998, 96 p.
- МАМЕДОВ Р. Formation of international legal status of the Caspian Sea in the post-Soviet period / R. Mamedov// Central Asia and the Caucasus. 2 (8) 2000.
- Mamedov R.M. 2002. Model of the oil pollution transport process in the southwestern part of the Caspian Sea, 7-th International Conference Gas in Marine Sediments, Baki, October 7-12, p.139-142.
- Caspian National Emergency Response Centre, 2001, Report on the collection of information on vulnerable areas as part of the national and regional Oil Spill Response Plan, Global Environment Facility - United Nations Development Programme.
- Mitrofanov, I. V., 2001, Review and assessment of the impact on the fauna of invertebrates, fish, birds and marine mammals in the Kazakhstan part of the Caspian Sea in the form of heavy metals, pesticides and hydrocarbons, Caspian Environmental Program.

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			240
Total Workload/30(h)			240/30

ECTS Credit of the Course	6
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MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Atmospheric ecology, modern pollutants.
Course Unit Code	ATMF-B04
Type of Course Unit	Selection
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	1
Practice (hour/week)	0.5
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Ulviyya Karimova-Jafarova
Name of Lecturer (s)	Ulviyya Karimova-Jafarova
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-

As a component of the natural environment, the atmosphere interacts with the Cosmos, the world ocean, the waters of the land and natural ecosystems. In modern times, atmospheric pollution has become a "scourge", a "disease" of humanity and society. This "scourge" occurs mainly as a result of the activation of human industrial activity and has a negative impact on the person himself, all living things, plants and the Biosphere as a whole. Atmospheric pollution is most often associated with the development of industry and occurs in countries where factories, plants, vehicles, household enterprises are concentrated, where the lifestyle has reached a high level, where there is a high national income, and where there is a high level of energy use. In these countries, a large amount of carbon dioxide, various industrial gases and dust is added to the air. Atmospheric pollution is also a global problem and does not recognize natural and state borders, is not limited to them and spreads from densely populated settlements and industrially developed regions with intensive air pollution to settlements with a small population and clean air. Therefore, the problem of atmospheric pollution worries all mankind, all states and peoples should take care of its cleanliness.

The main task of the course is to reduce the negative impact of waste gases generated during the operation of various industrial enterprises on the environment, to develop scientifically substantiated proposals. In our republic, the study of the causes of the problem, the directions of its elimination, the development and implementation of specific measures in this direction are of great practical importance in solving environmental problems, studying its general theoretical methodological foundations and directions.

Objectives of the Course:

In order to achieve the goal set during the teaching of the subject, the following issues are intended to be solved:

- To investigate the current state of the problem of atmospheric pollution;
- To investigate the composition, physical and chemical transformations of the gases that make up the atmosphere;
- To investigate the processes occurring in the layers of the atmosphere;
- To investigate the negative effects of ferrous and non-ferrous metallurgy, oil and gas industry enterprises on the atmosphere and to take measures to reduce the negative effects;
- To improve the operation of purification facilities in order to reduce the negative effects of waste gases generated during the work of agricultural enterprises on the environment;

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	<p>In order to achieve the goal set during the teaching of the subject, the following issues are intended to be solved:</p> <ul style="list-style-type: none"> – Investigate the current state of the problem of atmospheric pollution; – Investigate the composition, physical and chemical transformations of the gases that make up the atmosphere; – Investigate the processes occurring in the layers of the atmosphere; – Investigate the negative effects of ferrous and non-ferrous metallurgy, oil and gas industry enterprises on the atmosphere and take measures to reduce the negative effects; – Improve the operation of purification facilities in order to reduce the negative effects of waste gases generated during the work of agricultural enterprises on the environment; 	

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

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

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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Structure and composition of the atmosphere.	
2		Sources of natural pollution of the atmosphere.	
3		Toxic wastes emitted into the atmosphere from mining and quarrying enterprises.	
4		Toxic wastes emitted into the atmosphere from oil industry enterprises.	
5		The role of alternative energy sources in protecting the atmosphere.	
6		Sources of radioactive pollution of the atmosphere.	
7		Ecological problems caused by electromagnetic radiation transmitted through the atmosphere.	
8		Pollution of the atmosphere by transport emissions.	
9		Greenhouse gases and their impact on climate change.	
10		The ozone layer of the atmosphere.	
11		Acid rain.	
12		Photochemical pollution of the atmosphere.	
13		Monitoring of the atmosphere. Permissible norms of atmospheric pollution.	
14		State regulation in the field of atmospheric air protection in the Republic of Azerbaijan.	

Recommended Sources TEXTBOOK(S)

- N.A. Verdizade, M.H. Isgandarov “Fundamentals of Ecology and Nature Protection” 232 pages, 2008.
- Sh. Ahmadov, N. Muradov “Ecology. Atmospheric Pollution” 84 pages, 2008.
- G.Sh. Mammadov “Ecology and Environmental Protection”, 2005.
- J. Mahmudov “Ecology” 320 pages, 2008.
- A.M. Maharramov, M.R. Bayramov, I.G. Mammadov “General Chemical Technology” 308 pages, 2011.
- M.G. Mammadli, “Technology of Oil and Gas Processing” 1964.
- J.M. Mahmudov “Technology of Production Areas and Industrial Ecology”, 2006.
- A.S. Sadigov, I.B. Khalilov “Ecology and Environmental Protection”, 2004.
- Q.T. Mustafayev, E.A. Alizade “Ecology” 2001.
- N.A. Salimova, B.Sh. Shahpalangova, A. Babayev “Engineering Ecology” 634 pages, 2012.
- N.A. Salimova, B.Sh. Shahpalangova “Improvement of the Ecological State of Azerbaijan” 91 pages, 2008.
- Salimova N.A. New ecologically safe processes. Textbook, Azerbaijan State Oil Academy. Baku: ADNA, 2009, 162 p.
- A.S. Akhmetov “Technology of deep oil and gas processing” 672 p. UFA 2002 Rustamov M.I. Environmental problems of the Earth and alternative energy sources / M.I. Rustamov, V.M. Abbasov, T.A. Mamedova, N.N. Piriev. - Baku: ELM, 2008,
- Panin V.F., Sechin A.I., Fedosova V.D. Ecology: Textbook for universities. Ed. V.F. Panin. - Tomsk Polytechnic University. - Tomsk: Publishing house of Tomsk Polytechnic University, 2014. - 327 p.

– Vronsky V.A. Ecology and the environment: verbal reference / M.; Rostov on / D: March, 2008. 432 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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and Environment”.

Course Unit Title	Environmental management
Course Unit Code	ATMF-B04
Type of Course Unit	Selection
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	1

Practice (hour/week)	0.5	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered		
Course Coordinator		
Name of Lecturer (s)		
Name of Assistant (s)	-	
Mode of Delivery		
Language of Instruction		
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
<p>Environmental Management is a subject that teaches theoretical and practical knowledge in the field of environmental protection, sustainable use of natural resources and ensuring the health of ecosystems. This subject covers the study of various approaches to managing environmental problems, developing strategies for environmental protection in organizations and ensuring sustainable development. The main goal of the Environmental Management subject is to provide students with the necessary knowledge and skills in the field of ecosystem management, environmental risk assessment, natural resource protection and combating climate change. Students also develop practical approaches to solving environmental problems by analyzing environmental policies and laws, environmental management systems, environmentally friendly technologies and ecosystem services. This subject is built on both theoretical knowledge and practical applications and provides students with the ability to make the right decisions at the level of organizations and governments to protect the environment and solve environmental problems. Knowledge in the field of environmental management allows students to work on real-world problems and find environmentally friendly solutions, not only with theory.</p>		
Objectives of the Course:		
The aim of the Environmental Management course is to provide students with theoretical and practical knowledge in the field of environmental protection and sustainable use of natural resources.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Understanding the Basic Principles of Environmental Management -Understanding the Fundamentals of Sustainable Development -Assessing and Managing Environmental Risks -Analyzing Environmental Impacts	
2	-Management and Valuation of Ecosystem Services. -Sustainable Use of Natural Resources.	
3	Environmental Protection and Environmental Law. -Evaluating the Impact of Environmental Management on Organizations.	
4	Analyzing the Social and Economic Impacts of Environmental Management.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Analyzing the Social and Economic Impacts of Environmental Management.	
2		The Relationship between Sustainable Development and Environmental Management.	
3		History and Development of Environmental Management.	
4		Legislation and International Agreements for Environmental Management.	
5		Environmental Risk Assessment and Management.	
6		Sustainable Use and Management of Natural Resources.	
7		Industry and Environment: Management and Reduction of Environmental Impact.	
8		Ecosystem Services and Their Management.	
9		Ecological Certification and Assessment of Environmental Performance of Companies.	
10		Climate Change Management and Adaptation Strategies.	
11		Management and Monitoring of Environmental Impacts.	
12		International Environmental Standards and Organizations.	
13		Environmental Management Systems and Application in Industries.	
14		Corporate Social Responsibility (CSR) in Environmental Management.	

15		Innovative Technologies and Digital Tools in Environmental Management.	
<p>Recommended Sources TEXTBOOK(S)</p> <ul style="list-style-type: none"> – Bertin, W. (2012). Environmental Management: Principles and Practice. 2nd ed. Pearson Education – Redclift, M., & Woodgate, G. (2010). The International Handbook of Environmental Sociology. Edward Elgar Publishing – Hart, S. L. (1995). A Natural Resource-Based View of the Firm. Academy of Management Review. – Williams, D. (2001). Sustainable Development and the Environmental Management System. Wiley. – Lélé, S. M. (1991). Sustainable Development: A Critical Review. World Development, 19(6), 607-621. – EPA (2007). Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations. United States Environmental Protection Agency. – Bansal, P., & Roth, K. (2000). Why Companies Go Green: A Model of Ecological Responsiveness. Academy of Management Journal, 43(4), 717-736. – Elkington, J. (1997). Cannibals with Forks: The Triple Bottom Line of 21st Century Business. New Society Publishers. – Peattie, K. (2001). Sustainable Marketing. Pearson Education. – Murray, M. T., & Jones, S. M. (2013). Corporate Social Responsibility and Environmental Sustainability in the Supply Chain. Routledge. – Hitchcock, D., & Willard, M. (2009). The Business Guide to Sustainability: Practical Strategies and Tools for Organizations. Earthscan. 			
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			
<ul style="list-style-type: none"> • 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	240
Total Workload/30(h)	240/30
ECTS Credit of the Course	5

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and Environment”.

Course Unit Title	Management of specially protected natural areas.	
Course Unit Code	ATMF-B04	
Type of Course Unit	Selection	
Level of Course Unit		
National Credits		
Number of ECTS Credits Allocated	5	
Theoretical (hour/week)	1	
Practice (hour/week)	0.5	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered		
Course Coordinator	Ulkar Gadiyeva	
Name of Lecturer (s)	Ulkar Gadiyeva	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijan	
Prerequisites	-	
Recommended Optional Program Components	-	
The subject "Management of Specially Protected Natural Areas" provides an opportunity to obtain information about the protection of biological diversity and the elimination of dangerous factors affecting it, etc.		
Objectives of the Course:		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Written method. Oral method. Mixed method. Open book method. Presentation method. Test method. 1. Consultation hours are organized before the exam. 2. Exams and midterm exams (collegiums) are conducted in written form. 3. Issues related to the admission of students to exams and midterm exams are resolved by the dean of the faculty. Exams and midterm exams are conducted in accordance with the “Rules for the Organization of Training with the Credit System at the Bachelor's and Master's Levels of Higher Education Institutions” approved by the Resolution No. 348 of the Cabinet of Ministers of the Republic of Azerbaijan dated December 24, 2013.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Specially protected natural areas, general understanding of their protection.	
2		Ecological factors affecting specially protected natural areas.	
3		Protection of the plant world.	
4		Protection of the plant world.	
5		Protection of the animal world.	
6		Impact of environmental degradation on human development.	
7		Ecology of forests.	
8		Morphology of forests.	
9		Importance of nature reserves and impact of external anthropogenic factors on the ecosystem. Ecological consequences of global climate change.	
10		State Nature Reserves of Azerbaijan (Zagatala, Ilisu, Garayazi reserves).	
11		State Nature Sanctuaries.	
12		National parks of Azerbaijan.	
13		Ecological awareness activities in recreation zones.	

14		Impact of anthropogenic factors on specially protected natural areas.	
15		Law of the Republic of Azerbaijan on specially protected natural areas and objects.	
16		Essence and protection of natural monuments.	
Recommended Sources TEXTBOOK(S) <ul style="list-style-type: none"> – G.T.Mustafaev, E.A.Alizadeh – Ecology, Baku, «Ozan»- 2001. – Mammadov G.Sh., Khalilov M.Y. Encyclopedic ecological dictionary. Baku-Elm-2008 – N.A.Salimova, B.Sh.Shahpalengova, A.I.Babayev. Engineering ecology. Baku-2012 – T.S.Mammadov, H.H.Asadov “Plant ecology” “Elm” publishing house, Baku-2014 – A.A.Asgarov, F.G.Aliyev, E.M.Huseynov, S.T.Aliyev “Modern ecology” Baku-2007 – Muradova E.O. Principles of democratic ecological education. Bakr: Elm, 2009, 445 p. – Mustafayev Q.T. Nature protection (textbook). Bakr, BSU, 1970, 194 p – Flint V.E. Strategy for conservation of rare species. M.: Nauka, 2000, 328 p. – http://www.eco.gov.az/mus.php?id=1755 Archived 2010-09-21 at the Wayback Machine 			
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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

MODULE HANDBOOK

Device Engineering bachelor program, Department of "Information Technologies".

Course Unit Title	Land structure and cadastre
Course Unit Code	ATMF -BO5
Type of Course Unit	Selection
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Ulkar Gadiyeva
Name of Lecturer (s)	Ulkar Gadiyeva
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 Geography is unique as it encompasses various branches such as the physical science (includes Geomorphology, Climatology, Oceanography, Bio-diversity), human geography (includes demography, cultural geography, economic and commercial geography, transport geography, regional planning, political geography, industrial geography, tourism geography), interdisciplinary (includes geophysics, geochemistry, environmental geography) and applied geography (quantification, cartography, GPS and GIS). Each of the specialized branch of geography adopts a scientific method in its quest to bring out contemporary issues and find relevant solutions crucial for achieving desired results. This chapter explains the research frontiers in geography, methods and types of geographical research and significance in undertaking geographical research.	
Objectives of the Course: Geographical studies are distinct from any other disciplines as it emphasizes on spatial aspects at a particular time period or over a time period. It deals with locational and regional attributes and their spatial relations which shape the earth's surface. Geography analyses the physical, socio-cultural, economic, political landscape and the relationships between places over the period of time. It thus seeks to examine the relationship between the earth and its people through the study of place, space and environment-asking questions of where, what and also why and how? Geographical investigations also examine regional differences, patterns and interrelationship so as to get a better understanding of both the physical and human world by analyzing the spatial form and patterns of distribution and interactions. Of late with digital revolution and application of GIS, the modern simulations models help predict the future spatial changes that may occur with reference to any aspect under study.	
Learning Outcomes	

At the end of the course the student will be able to		Assessment
1	This geographical research studies therefore helps to provide appropriate policies and planning measures for implementation and smooth functioning of the environment and the society. Research Methodology in geography has witnessed drastic changes over the past century as much of the geographical concerns ranged over contemporary physical and human space and into their past arrangements, for which the methods adopted became progressively more quantitative. (Gomez & JonesIII, 2010). With advanced technologies and theoretical perspectives of the latter decades of the twentieth century, the geographical inquiry and methods of data collection and analysis helped to expand its research scope with regards to object / subject studied. At the same time, they also raised concern about the criteria, norms, and values for human action and conduct (ethics); how we position ourselves and are positioned by others (positionality); and the relationship we, as researchers, have with the world (reflexivity) (Gomez & JonesIII, 2010).	
2	The physical branches of geographical research have undergone tremendous improvements with the availability of satellite observed data since 1970's. Simultaneous developments took place in human geography with the use of spatial data analysis through quantitative methods and scientific approach in an attempt to explain the past and prevailing outcomes of the human societies with their landscapes. Some of the significant approaches which emerged since 1970's are those of humanistic, Marxist, feminist, and poststructuralist geography.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	

8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Research object, subject and tasks of the course "Historical necessity of planning of land management works.	
2		Content of organization and planning of land management works.	
3		The necessity and subject of land cadastre.	
4		Purpose and types of land management works.	
5		Rules for construction works.	
6		Rules of Land cadastre.	
7		Participants of the construction production process.	
8		State registration of land rights, quantitative and qualitative registration of lands.	
9		Field survey and chamber-final works for inventory of irrigated lands.	
10		For inventory of irrigated land construction field survey and camera-finalizing works.	
11		Conducting complex construction projects (works). rules. In the design of complex land construction projects state, municipal and privately owned lands determination	
12		Rules for preparation of municipal maps. Municipality maps.	
13		Rules for carrying out complex land management projects (works). Identification of state, municipal and privately owned lands in the compilation of complex land management projects.	
14		Scientific and methodological bases of sustainable ecological landscape construction and planning in land management	
15		Determination of land shares taking into account the quality of lands to be privatized by state farms, collective farms and other agricultural enterprises	

Recommended Sources

TEXTBOOK(S)

- G.Sh.Mammadov. Land reform in Azerbaijan: legal and scientific environmental issues. Baku: Elm, 2002, 412 p.
- G.Sh.Mammadov. State Land Cadastre of the Republic of Azerbaijan: legal, scientific and practical issues., Baku: Elm, 2003, 448 p.
- G.Sh.Mammadov. Socio-economic and environmental foundations of the efficient use of land resources of Azerbaijan., Baku: Elm, 2007, 856 p.
- G.Sh.Mammadov, T.N.Nizamzade, A.B.Jafarov. Scientific foundations of land structure. Baku: Elm, 2012, 112 p.
- Karlekar Shrikant and Kale Mohan (2005): Statistical analysis of Geographical data, Dimond publication

<ul style="list-style-type: none"> - Singh & Kanauja : Map work and Practical Geography. - Sumner G J (1978): Mathematics for physical geographers. Edward Arnols - Taylor, P.J.(1977): Quantitative Methods in Geography. Houghton Mifflim Company,Boston University Press. - V. Natarajan P., Adler Ron K.: Advanced Surveying, B. 1 Publ. Bombay - Watson, G. and McGraw, D.(1980): Statistical Inquiry, John Wiley and sons,New York. - Yeates, M. (1974). An Introduction to Quantitative Analysis in Human Geography,McGraw Hill, New York. 			
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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			6

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Application of cadastral maps
Course Unit Code	ATMF-B05
Type of Course Unit	Selection
Level of Course Unit	3
National Credits	
Number of ECTS Credits Allocated	6

Theoretical (hour/week)	1	
Practice (hour/week)	1	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered	5	
Course Coordinator	Piriyeva Masuma	
Name of Lecturer (s)	Piriyeva Masuma	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani, English, Russian	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
<p>Kadastr xəritələrinin tətbiqi" fənni tələbələrə torpaq və əmlak idarəçiliyində istifadə olunan kadastr xəritələrinin hazırlanması, təhlili və praktik istifadəsi ilə bağlı nəzəri və tətbiqi bilikləri aşılamağı hədəfləyir. Bu fənn vasitəsilə tələbələr kadastr məlumatlarının mənbələri, onların toplanması və kartoqrafik şəkildə təqdim edilməsi metodikası ilə tanış olurlar. Xəritələrin coğrafi informasiya sistemləri (GIS) əsasında tərtibi və analiz imkanları da fənnin əsas mövzularındandır.</p> <p>Fənn həmçinin torpaqdan istifadə hüquqları, mülkiyyət formaları, torpaq qeydiyyatı və planlaşdırma kimi sahələrdə kadastr xəritələrinin rolunu vurğulayır və müasir rəqəmsal texnologiyaların tətbiq imkanlarını araşdırır</p>		
Objectives of the Course:		
Tələbələrə kadastr xəritələrinin qurulması, oxunması, təhlili və praktiki tətbiqi sahəsində bilik və bacarıqlar qazandırmaq; torpaq idarəçiliyində bu xəritələrin funksional rolunu başa salmaq.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	-Will be able to explain the essence and structure of the cadastral system; -Will be able to recognize the types and application areas of cadastral maps.	
2	Will be able to demonstrate map reading and analysis skills; -Will be able to explain the processes of collecting and processing cadastral data.	
3	-Will be able to apply programs used in the creation of digital maps (e.g., GIS); -Will acquire the ability to use map materials in land registration and planning;	
4	It will be able to analyze existing map data and use it in land and property decisions.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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 cadastral system: concepts and objectives.	
2		Historical development and legal basis of cadastral maps.	
3		Types and structure of cadastral maps.	
4		Map reading and data interpretation.	
5		Field measurements and data collection.	
6		Digital mapping and software.	
7		GIS technologies and their application in cadastral systems.	
8		Determination of land boundaries.	
9		Land registration and legal issues.	
10		Cadastral databases and management.	
11		The role of cadastral maps in urban development and planning.	
12		Mapping of surface and underground objects.	
13		Comparison of digital and analog maps.	
14		Updating cadastral maps and change management.	
15		Cadastral data management and communication with state structures.	

Recommended Sources TEXTBOOK(S)

- Aliyev H.A. – Land cadastre and land use. Baku: Education, 2012.
- Garayev N.A. – Cadastral systems and mapping. Baku: BSU, 2018.
- Aliyeva S.T. – Geographic information systems and applications. Baku: Science and Education, 2020.
- Əliyeva S.T. – Coğrafi informasiya sistemləri və tətbiqi. Bakı: Elm və Təhsil, 2020.
- Dale P., McLaughlin J. – Land Administration. Oxford University Press, 2000.
- Williamson I., Enemark S. – Cadastre 2014 and beyond. FIG Publication, 2005.

<ul style="list-style-type: none"> – Zevenbergen J. et al. – Land Administration for Sustainable Development. ESRI Press, 2013. – Longley P. et al. – Geographic Information Systems and Science. Wiley, 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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			6

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and Environment”.

Course Unit Title	Design and application of general geographic maps.
Course Unit Code	ATMF-B05
Type of Course Unit	Selection
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	1

Practice (hour/week)	1	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered		
Course Coordinator		
Name of Lecturer (s)		
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
The subject of General Geographical Map Design and Application studies the basic principles and methods related to the collection, processing and presentation of geographic data. This subject covers theoretical and practical knowledge regarding the preparation and application of geographic maps.		
Objectives of the Course:		
The aim of the General Geographical Map Design and Application course is to teach students basic knowledge in the field of collecting, processing, analyzing and presenting geographic data. This course aims to develop theoretical and practical skills related to the preparation and use of geographic maps. The course covers the preparation of various types of geographic maps (physical, political, economic and thematic), the selection of map projections and the basic principles of using geographic information systems (GIS). Students will learn how geographic maps are used in various fields, what principles are followed in the preparation of these maps and the correct presentation of data. Also, the development of map reading, analysis and drawing useful conclusions from geographic data allows students to gain extensive experience in this field. This course provides both theoretical knowledge and practical skills, allowing them to gain in-depth analysis and application skills in the fields of geography and cartography.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Understand the types and functions of geographic maps. -Understand the principles of map projections. -Develop the ability to use geographic information systems (GIS).	
2	-Understand map elements and their functions. -Develop map reading and analysis skills.	
3	Presenting geographic information accurately and effectively.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing	

	technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		History and Development of Geographic Maps.	
2		Types and Functions of Geographic Maps.	
3		Basic Principles of Cartography.	
4		Map Projections and Their Selection.	
5		Geographic Information Systems (GIS) and Applications.	
6		Collection and Processing of Geographic Data.	
7		Cartographic Symbols and Information Presentation on Maps.	
8		The Impact of Cartography on the Environment and Economy.	
9		Map Visualization and Interactive Maps.	
10		Satellite Data and Mapping.	
11		Analysis of Climate Change in Geographic Maps.	
12		Reliability and Accuracy of Geographic Data.	
13		Application of Geographic Maps in Education and Training.	
14		Role of Geographic Maps in Urban Planning.	
Recommended Sources			
TEXTBOOK(S)			
<ul style="list-style-type: none"> – Cartography (G. M. Garayev, 2015) – Theoretical and practical knowledge on the compilation and design of geographical maps. – Geographic Information Systems (E. M. Rustamov, 2018) – A textbook on GIS programs and processing geographical data. – Preparation and Application of Geographic Maps (H. H. Huseynov, 2019) – Practical instructions on the preparation and use of various types of maps. – Geography and Cartography (A. R. Aliyev, 2017) – General information on the analysis of geographical data and map preparation. – Cartography and Map Design (R. M. Aliyev, 2020) – A textbook on map design, projections and visual presentation. 			

- Visual Presentation of Geographic Maps (A. F. Abdullayev, 2021) – Principles and methods of visual presentation of data on maps.
- Geographic Information Systems and Cartography Applications (L. H. Hasanov, 2022) – GIS systems and areas of mapping application.
- Map Preparation and Analysis (T. Sh. Mammadov, 2016) – Map preparation and analysis methods.
- "Cartography: Thematic Map Design" (Borden D. Dent, 2008) – Kartoqrafiyanın əsas prinsipləri və tematik xəritələrin hazırlanması barədə geniş məlumat verir.
- "Geographic Information Systems and Science" (Paul A. Longley, Michael Goodchild, David J. Maguire, David W. Rhind, 2015) – Coğrafi məlumat sistemləri (GIS) və onların tətbiq sahələri haqqında dərslik.
- "Introduction to Modern Cartography" (William M. T. Miller, 2014) – Müasir kartoqrafiyanın əsasları, xəritə hazırlığının nəzəri və praktik tərəfləri.

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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			6

MODULE HANDBOOK**Ecology bachelor program, Department of "Ecology and Environment".**

Course Unit Title	Regional ecology
Course Unit Code	ATMF-B06
Type of Course Unit	Selection
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Aruz Mikayilov
Name of Lecturer (s)	Aruz Mikayilov
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-
Course description: Regional ecology is a branch of ecology that studies the interactions of living and non-living components in different geographical regions, the impact of these relationships on the environment, and the specific ecological consequences of human activity. This field was formed at the intersection of geography, biology, ecology, and environmental sciences. Regional ecology is focused on the analysis and solution of environmental problems at the regional level, taking into account the spatial variability and local characteristics of ecosystems. In regional ecology, various ecosystems (forest, mountain, river basin, semi-desert, urban ecosystems, etc.) are considered as research units. Regions are classified based on ecogeographical indicators (climate, soil, hydrography, flora and fauna, etc.). Regional ecology is engaged not only in analyzing the situation, but also in developing regional strategies for environmental protection.	
Objectives of the Course: The main goal of the subject "Regional Ecology" is to provide students with scientific and systematic knowledge about the structure, function, dynamics of ecological systems in various geographical regions and the impact of human activity on these systems. This subject, in addition to forming theoretical foundations and practical skills for understanding ecological phenomena in a regional context, also aims to develop a responsible approach to the environment in students. Regional ecology, as an applied field of ecology, presents scientific methodologies for assessing the impact of humans on the environment by studying the spatial variability of natural complexes. This subject covers issues such as: Assessment of natural resource potential. Identification of ecological risks. Analysis of the nature and intensity of anthropogenic pressures, and study of the consequences of these impacts. Thus, the main goal of the subject is to understand the essence of ecological processes on a regional scale and direct this knowledge to environmental protection.	
Learning Outcomes	
At the end of the course the student will be able to	Assessment

1	<ul style="list-style-type: none"> – Can explain the basic concepts, principles and theoretical approaches of regional ecology. – Understands the interaction of natural and anthropogenic ecological factors in different geographical regions. – Can explain the structure and functions of ecosystems in the context of regional differences. 	
2	<ul style="list-style-type: none"> – Has knowledge about the sustainability and risk factors of regional ecosystems. – Understands the different manifestations of local and global environmental problems in different regions. – Can analyze and assess the ecological situation in different regions. 	
3	<ul style="list-style-type: none"> – Can identify cause-effect relationships of regional environmental problems. – Can collect and analyze regional environmental data (statistics, maps, GIS data, etc.). – Can prepare reports using field observations and monitoring data. 	
4	<ul style="list-style-type: none"> – Can collect and analyze regional environmental data (statistics, maps, GIS data, etc.). – Can prepare reports using field observations and monitoring data. – Can apply the main methods and tools used in regional environmental assessment (e.g. GIS, ecological indicators, mapping, etc.). 	
5	<ul style="list-style-type: none"> – Can put forward realistic proposals for regional environmental planning and decision-making processes. – Can identify environmental risks and suggest ways to prevent them. 	

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

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

	information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Objectives and tasks of the subject. Ecological regions of the world: comparative characteristics and criteria for differentiation.	
2		Comparison of anthropogenic impact on the environment by regions. Modern anthropoecosystems.	
3		Climate change and regional consequences.	
4		Desertification processes in the world and the chronicle of the Sahel zone disaster.	
5		Regional ecological state of forest ecosystems of the world.	
6		Rising ocean levels. Modern ecological state of the Caspian and Aral lakes.	
7		Depletion of freshwater sources and the state of the regions.	
8		Ecological problems of river basins on a global scale: on the example of the Amazon, Nile and Kura rivers.	
9		Distribution of plastic and household waste by regions: problems and alternatives.	
10		Modern sources of pollution of the oceans and seas and comparative characteristics.	
11		Natural disasters on a regional scale and their ecological consequences.	
12		Regional ecological consequences of nuclear tests and technogenic accidents. On the example of Chernobyl and Fukushima-1 NPP.	
13		The world food problem causes and solutions.	
14		Status of the main ecological problems in the mountainous and plain regions of Azerbaijan.	
15		Alternative energy sources and their application by regions. Biodiversity protection by regions: national and international efforts.	

Recommended Sources

TEXTBOOK(S)

- Garibov Y.A. World landscapes and ecological problem's part I.2005.p-35.
- Garibov Y.A. World landscapes and ecological problem's part II.2014.p-384.
- Garibov Y.A. Optimization of natural landscapes of the Republic of Azerbaijan. 2012.p-216.
- Mammadov G.Sh., Khalilov M.Y. Ecology, environment and man. Baku, – 2006, 608 p.
- Mammadov G.Sh., Khalilov M.Y. Ecology and environmental protection. Baku,– 2005, 880 p.
- Pasha. N.H. Environmental management. Lecture notes. 2024, 75 p.
- Khalilov T.A., Zeynalova M.A. Global ecological problems. Baku, "MBM", 2013, 212 p.
- Goychayli Sh.Y. Fundamentals of geographical ecology. 2010. 468 p.

- Goychayli Sh.Y. Economic and ecological foundations of nature use. Baku, 2006, 170 p.
- Ahmadov Sh., Aghayev F. Et al. General ecology. Baku, 2005, 100 p.
- Ahmadov Sh.A., Muradov T.M. Ecology. Atmospheric pollution. Baku. 2008. 84 p.
- Aliyev R.N. Alternative energy and ecology. Baku: Teknur. 2015. 368 p.
- Chesnokova, T.V. Textbook on ecology. - Ivanovo, 2012. - 100 p.
- Deryabin, V.A. Ecology: textbook - Yekaterinburg: 2016. - 136 p.
- Korsak M.N., Mosharov S.A., Pestryakov A.P., et al. Ecology: Textbook / - Moscow: Publishing house of Moscow State Technical University named after N.E. Bauman, 2006. - 240 p.
- Sokolova, N.A. General ecology: teaching aid. - Volzhsky, 2022. 196 p.
- Tretyakova, N.A. Fundamentals of general and applied ecology. - Yekaterinburg, 2015. - 112 p.
- Isachenko A.G., Shlyapnikov A.A. Landscapes. Nature of the world. M. 1989. st-504
- Larionov, N. M. Industrial ecology: textbook and workshop. M. 2018. - 382 p.
- Yasoveev M.G., Kakareka E.V., Shevtsova N.S., Shershnev O.V. Industrial ecology. Minsk - BSPU, 2010 - 220 p.
- Tutorial "Regional Ecology" -Krasnodar, 2015. - 80 p.
- Internet resources.
- Ecological atlases and maps.

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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and Environment”.

Course Unit Title	Environmental safety of alternative energy sources.	
Course Unit Code	ATMF-B06	
Type of Course Unit		
Level of Course Unit		
National Credits		
Number of ECTS Credits Allocated	5	
Theoretical (hour/week)	1	
Practice (hour/week)	1	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered		
Course Coordinator	Leyla Javadova	
Name of Lecturer (s)	Leyla Javadova	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani,English,Russian	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
Considering the gradual depletion of traditional energy sources and the huge amount of damage caused to the environment during their use, environmentally friendly alternative (renewable) energy sources (solar and wind energy, small hydroelectric power plants, thermal waters, biomass energy) are widely used in developed countries of the world. The course is based on material on the indicated topics.		
Objectives of the Course:		
To teach the fundamentals of the subject and to develop an understanding of their application in life. One of the goals of the course is to create conditions for students to increase their knowledge, develop critical thinking and problem-solving skills by working with examples and cases. One of the goals of the course is to give students experience with concepts used in science such as observation, logic, analysis, objectivity, accuracy and fluent communication.		
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, scientific research methods, and its relationship with other sciences; Formation of ideas about practical work related to the use of AEM;	
2	Formation of ideas about the means of teaching; Formation of ideas about pedagogical principles, teaching methods.	
3	Formation of ideas about the goals and objectives of teaching in students; Forming students' ideas about the content of the course.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Introduction. Traditional and non-traditional energy sources.	
2		Main methods of energy production.	
3		World reserves of oil and gas.	
4		Alternative energy sources. Solar energy. Development prospects of solar energy.	
5		Wind energy.	
6		Energy of the world ocean.	
7		Prospects of using renewable energy.	
8		Biomass energy.	
9		Energy of the future. Hydrogen.	

Recommended Sources

TEXTBOOK(S)

- State Program on the use of alternative and renewable energy sources in the Republic of Azerbaijan.–2004.
- Y.B.Orujov, G.Sh.Abbasov, S.M.Gozalov, N.J.Alekperova. —Electric machines||. Ganja ADAU- 2010.
- Sh.J.Karimov, M.M.Bagirzade, O.Kh.Huseynov. —Electrification of agricultural production|| Ganja - 2008.
- Jalilov M.F. Alternative regenerative energy systems. Baku-2009.
- B. Guliyev, E.M. Namazov. "Solar energy and ecology". Ganja - 2001.
- I.A.Gilinsky. Thermal, hydraulic and wind engines of rural power plants. Moscow. 1958.

<ul style="list-style-type: none"> – R.R.Bezrukikh., D.S.Strevkov. Renewable energy. (Strategy, resources, technologies). Edited by academician D.S.Strevkov. Moscow, 2005. – T.B.Leshchinskaya. "Power supply of agriculture". Moscow. "Kolos" - 2006. – A.A.Fedorov, L.E.Starkova. "Study manual for course and diploma design". Moscow. "Energoatomizdat". 1987. 			
Assessment			
Attendance	10%	At least 75% class attendance is compulsory	
Presentation	10%		
Quiz	0%		
Seminars	30%		
Midterm Exam	0%		
Final Exam	50%		
Total	100%		
Assessment Criteria			
Final grades are determined according to the Academic Regulations of WCU			
Course Policies			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Ecological foundations of nature use.
Course Unit Code	ATMF-B06
Type of Course Unit	Selection
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	1
Practice (hour/week)	1

Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Ulkar Gadiyeva
Name of Lecturer (s)	Ulkar Gadiyeva
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani,English,Russian
Prerequisites	-
Recommended Optional Program Components	-
Course description:	
The science of ecological foundations of nature use is a scientific field that studies the relationship between humans and nature and its resources, and how this relationship affects ecosystems and ecological balance. The main goal of the science is to minimize the negative impacts of human activities on nature, taking into account ecological regularities when using nature. This field, in addition to solving environmental problems, seeks to ensure the efficient and sustainable use of natural resources.	
Objectives of the Course:	
The aim of the subject "Ecological Fundamentals of Nature Use" is to understand the impact of human activity on nature and the environment, and to emphasize the importance of sustainable use and protection of natural resources. This subject teaches ecological principles related to various components of nature (air, water, soil, biological diversity) and the importance of these principles for the economy and society.	
Learning Outcomes	
At the end of the course the student will be able to	
1	The discipline of ecological foundations of nature use, while studying the use of nature from an ecological perspective, takes into account the impact of human activities on nature and ecosystems and evaluates the ecological consequences of these activities. The results of this discipline provide important information and suggestions for the protection of ecosystems, biological diversity, and the environment in general.
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz	
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the

	production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Basic concepts and principles of ecology.	
2		The impact of human activity on ecosystems.	
3		Natural resources and their types.	
4		Modern problems of nature use.	
5		Sustainable development and ecological balance.	
6		Management and protection of natural resources.	
7		The impact of nature uses on the economy.	
8		Environmental legislation and international cooperation.	
9		Ecological monitoring and assessment.	
10		Protection and education of natural resources.	
11		Anthropogenic impact and environmental pollution.	
12		Ecosystem services and their importance.	
13		Renewable energy and environmental impacts.	
14		The impact of climate change on ecosystems.	
15		The role of ecological inspection and monitoring.	

Recommended Sources

TEXTBOOK(S)

- Kasimov, M. (2015). "Ecological Theory and Ecosystems." Baku: Science and Education.
- Aghayev, R., & Huseynov, F. (2018). "Nature and Humans: Ecological Relationships." Baku: Economics University Publishing House.
- Hassanov, M., & Aliyev, K. (2016). "Bioresources and Ecosystems: Management and Protection." Baku: Publishing House.
- Löb, S. (2017). "Ecology and Ecosystem Services." Nature and Ecology Journal, 15(2), 234-250.
- Daily, G. C. (1997). "Nature's Services: Societal Dependence on Natural Ecosystems." Washington, D.C.: Island Press.
- Meadows, D. H., Meadows, D. L., & Randers, J. (2004). "Limits to Growth: The 30-Year Update." Chelsea Green Publishing.
- Odum, E. P. (2004). "Fundamentals of Ecology." Saunders College Publishing.
- Carson, R. (1962). "Silent Spring." Houghton Mifflin.

Assessment

Attendance	10%	At least 75% class attendance is compulsory
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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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Agrochemistry and environmental protection
Course Unit Code	ATMF-B07
Type of Course Unit	Selection
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	

Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Shahbaz Shirəliyev
Name of Lecturer (s)	Shahbaz Shirəliyev
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani,English, Russian
Prerequisites	-
Recommended Optional Program Components	-
Course description:	
<p>Agrochemistry, as a science of optimizing plant nutrition, studies the application of fertilizers and soil fertility, taking into account the bioclimatic potential to obtain high and quality products.</p> <p>In connection with the formation of new ecological functions and the expansion of the fields of this science, the concepts of agrochemistry are constantly improving.</p> <p>The study of the complex, dialectical interaction between plants, soil, climate and agrochemical agents is considered the main issue of agrochemistry.</p> <p>Although agrochemistry is a young science, it began to function as an independent science before plant physiology. The basic rules of studying plant root nutrition were developed by agrochemists. As early as the end of the 19th century, the biological processes occurring in the soil: nitrification and fixation of atmospheric nitrogen by root bacteria of legumes attracted the attention of agrochemists. Much later, microbiologists began to study these processes.</p>	
Objectives of the Course:	
<p>The main goal of teaching the subject is to provide extensive information about soil, which is of great importance in agriculture and environmental health protection, its role in the agroecosystem, mineral fertilizers and pesticides used to protect soil fertility and increase plant productivity, and at the same time to teach students about alternative farming systems, environmental problems arising from the use of fertilizers and pesticides, and integrative pest control measures.</p>	
Learning Outcomes	
At the end of the course the student will be able to	
1	The benefits of studying agrochemistry in depth; The role of agrochemistry in environmental protection
2	The study and application of fertilizers and pesticides The harmful and beneficial aspects of pesticides for plants
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz	
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making

	and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		The subject of agrochemistry and its place among fundamental and applied sciences.	
2		Agrochemistry and soil fertility.	
3		Composition and properties of organic-mineral components of the soil.	
4		Balance and circulation of nutrients in the soil.	
5		Plant nutrition and types of nutrition.	
6		Aerial nutrition of plants (photosynthesis). Mineral (root) nutrition of plants.	
7		Importance of chemical elements in plant nutrition (Macroelements).	
8		Importance of microelements in plant nutrition.	
9		Mineral fertilizers. Nitrogen fertilizers, selection of their forms, timing and methods of application.	
10		Phosphorus fertilizers. The role of phosphorus in plant nutrition.	
11		Potash fertilizers. Optimization of the application of potash fertilizers.	
12		Organic fertilizers, their types and efficient use.	
13		Scientific foundations of the organization of the fertilization system.	
14		Ecological assessment of agrochemicals.	
15		Ecological functions of agrochemistry.	

Recommended Sources

TEXTBOOK(S)

- Agrochemistry. A.M. HUSEYNOV, N.V. HUSEYNOV, K.Y. MAMMADOVA
- Mammadov G, Khalilov M, Mammadova S. Agroecology. Baku 2010. 550 p.
- Babayev A., Babayev V. Fundamentals of ecological agriculture. Baku 2011, 383 p.

<ul style="list-style-type: none"> – J.M. Mahmudov “Technology of production areas and industrial ecology”, 2006. – G.Sh. Mammadov “Ecology and environmental protection”, 2005 – A.S. Sadigov, I.B. Khalilov “Ecology and environmental protection”, 2004 – G.T. Mustafayev, E.A. Alizade “Ecology” 2001. – Sh. Ahmadov, N. Muradov “Ecology. Atmospheric pollution” 84 p., 2008. – Brady, N. C., Weil, R. R., & Brady, N. C. (2010). Elements of the nature and properties of soils. – Mineev, V. G. (2006). Agrochemistry. 3rd edition. Moscow, science, 718 st, 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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and Environment ”.

Course Unit Title	Ecological problems of transportation
Course Unit Code	ATMF-B07
Type of Course Unit	Selection

Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	1
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Ulviyya Karimova-Jafarova
Name of Lecturer (s)	Ulviyya Karimova-Jafarova
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani,Russian,English
Prerequisites	-
Recommended Optional Program Components	-
Course description:	
The main goal of the "Ecological Problems of Transportation" course is to teach students the way of ecological thinking, to familiarize them with the ecological problems of the society they live in, to help them understand the environmental crisis sweeping the world and make the right decisions, and to help them become rational, informed, highly ecologically-minded ecologists and citizens for the country.	
Objectives of the Course:	
The subject "Ecological Problems of Transport" is included in the list of general, elective subjects and teaches undergraduate students to understand that the road and transport complex is a strong source of environmental pollution. The subject studies the great role of transport in the pollution of water bodies, in addition, the significant role of transport in thermal pollution of the environment, the great harm caused not only to nature but also to human health by liquid fuel transport, the fact that the harmful waste it creates further exacerbates the problem of global warming and causes various diseases in humans, including respiratory and nervous system diseases.	
Learning Outcomes	
At the end of the course the student will be able to	
1	As a result of studying the course "Ecological Problems of Transport", undergraduates will master the basic ecological concepts and categories, their interrelationships, gain an idea of the ecological problems of transport as a complex and holistic system, and the role of the state and other institutions in solving these problems.
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz	
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Subject, goals and objectives of the subject of environmental problems of transport.	
2		Global environmental problems related to the transport system.	
3		Impact of vehicles on the environment, environmental risk and safety.	
4		Urban transport: noise, vibration, fuel consumption.	
5		Environmental pollution by exhaust gases of cars.	
6		General characteristics of the impact of transport on the ecosystem and the human body.	
7		Control over the environmental and road safety of transport. Accidents.	
8		Ways to solve the environmental problems of urban transport.	
9		Environmental problems of railway transport.	
10		Environmental problems of water transport.	
11		Environmental problems of air transport.	
12		Environmental problems of pipeline transport.	
13		Alternative fuels. Types of transport operating based on alternative and hydrocarbon fuels.	
14		Modern vehicles and their use.	
15		Development of transport in the Caspian region and its impact on the environment.	

Recommended Sources

TEXTBOOK(S)

– M.I.Rustamov, V.M.Abbasov, T.A.Mamedova, N.N. Piriev. Environmental problems of the Earth and alternative

energy sources. Baku, Elm, 2008, 717 p.			
– Golubev I.R., Novikov Yu.V. Environment and transport. - M.: Transport, 2007.			
– History of automobile transport. Access mode: www.auto-book.net p.			
– E.I.Pavlova, Ecology of transport, Moscow, Publisher: "Transport", 2000, 248 p.			
– V.K.Novikov, I.A.Minaeva, Ecology of water transport, Study guide, M., Altair-MGAVT, 2012, 344 p.			
– Pavlova, E. I. Ecology of transport: textbook and practical training for bachelors / E. I. Pavlova, V. K. Novikov. - 5th ed., revised. and additional. - M.: Publishing house Yurait, 2014. - 479 p. - Series: Bachelor. Basic course.			
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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Monitoring of terrestrial ecosystems.
Course Unit Code	ATMF-B07
Type of Course Unit	Selection
Level of Course Unit	

National Credits		
Number of ECTS Credits Allocated		5
Theoretical (hour/week)		1
Practice (hour/week)		1
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered		
Course Coordinator		
Name of Lecturer (s)		
Name of Assistant (s)		-
Mode of Delivery		Face to face
Language of Instruction		Azerbaijani,Russian,English
Prerequisites		-
Recommended Optional Program Components		-
Course description:		
Terrestrial Ecosystem Monitoring is a scientific field that studies the application of various methods and technologies to monitor, assess, and protect the state of terrestrial ecosystems. This discipline provides advanced methods that meet the modern requirements of ecology, allow monitoring the dynamics of the natural environment, and assess ecosystem services.		
Objectives of the Course:		
To help students understand the importance, objectives, and methods of monitoring terrestrial ecosystems. They will gain the skills to monitor environmental changes, ensure the sustainable use of natural resources, assess the health of ecosystems, and develop conservation measures.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Describe methods and tools for monitoring terrestrial ecosystems.	
2	Use a variety of measurement and assessment tools to assess ecosystem health.	
3	Use GIS and remote sensing technologies to monitor ecosystem changes.	
4	Suggest appropriate conservation and restoration strategies to maintain ecosystem services.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly	

	processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Introduction to Terrestrial Ecosystem Monitoring.	
2		Ecosystem Services and Monitoring.	
3		Monitoring Methods: Quantitative and Qualitative Methods.	
4		Use of Geographic Information Systems (GIS) and Remote Sensing Technologies.	
5		Measuring Ecosystem Health.	
6		Biodiversity Monitoring.	
7		Monitoring Pollution and Anthropogenic Impacts.	
8		Monitoring and Management of Ecosystem Services.	
9		Climate Change and Ecosystems	
10		Monitoring Soil Erosion and Degradation	
11		Impact of Natural Disasters on Ecosystems.	
12		Management of Water and Single Water Resources in Ecosystems.	
13		Restoration of Ecosystems and Different Restoration Methods.	
14		Monitoring and Conservation Strategies in Nature Reserves.	
15		Impact of Engineering and Restoration Technologies on Ecosystems.	

Recommended Sources

TEXTBOOK(S)

- Alizadeh A.E. – Protection and restoration of ecosystems. Baku: “Elm”, 2007.
- Hasanov V.M., Aliyev F.A. – Ecology and environmental protection. Baku: Education, 2014.
- Ismayilov A.F., Novruzov E.M. – Physical geography of Azerbaijan. Baku: Baku University, 2010.
- Alizadeh A.E. – Terrestrial Ecosystems and Ecosystem Services. Baku: “Elm”, 2015.
- Guzmán H., Parra R., Moraga P. – Monitoring Ecosystems: Methods and Applications. Springer, 2017.
- Müller M., Österle K., O’Brien M. – Environmental Monitoring of Ecosystems. Wiley, 2015.
- Vasilenko O., Poláková K. – Methods of Ecological Monitoring: Theory and Practice. Springer, 2013.
- Sánchez J.A., García L. – Ecosystem Management and Monitoring: A Practical Guide. Cambridge University Press, 2016.
- McIntyre S., Hobbs R.J. – Habitat Fragmentation and Landscape Ecology: Ecological Functioning and Management. Cambridge University Press, 2017.

<ul style="list-style-type: none"> – United Nations Environment Programme (UNEP) – www.unep.org – FAO (Food and Agriculture Organization) – Ecosystem Monitoring Resources: www.fao.org – NASA Earth Observatory – Ecosystem Monitoring and Remote Sensing: earthobservatory.nasa.gov – Global Biodiversity Information Facility (GBIF) – www.gbif.org – European Space Agency (ESA) – Earth Observation and Ecosystem Monitoring: www.esa.int 			
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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

MODULE HANDBOOK

Device Engineering bachelor program, Department of “Information Technologies”.

Course Unit Title	Global environmental problems
Course Unit Code	ATMF -B08
Type of Course Unit	Selection
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	4

Theoretical (hour/week)	1	
Practice (hour/week)	0.5	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered		
Course Coordinator	Ulkar Gadiyeva	
Name of Lecturer (s)	Ulkar Gadiyeva	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani,English	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
The ecological situation and problems of the Earth, which has rich natural resources and fascinating nature, are diverse and complex. The purpose of the subject is to discover various problems caused by natural and anthropogenic factors that prevent the protection and efficient use of the world's nature and rich natural resources, and to find their natural solutions. In recent times, great attention has been paid to environmental problems that concern all mankind, and comprehensive measures are taken to solve them		
Objectives of the Course:		
This course provides extensive information about different regions of the world, population and economy and their differences. At the same time, a large space is devoted to the discussion of regional and global environmental problems. This course serves to form general geographical knowledge and ideas in students. At the same time, students will become familiar with the modern environmental problems of the world and Azerbaijan. During the teaching of this subject, they will acquire knowledge such as predicting ecological balance, its complex and closely related mechanisms, efficient use of natural resources, and keeping the natural environment suitable for life		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Acquiring professional knowledge about contemporary problems of world regions. He will get to know the nature, population and economy of the regions of the world in detail, he will learn to investigate and analyze the problems arising from natural, economic and social processes and to determine ways to eliminate them.	
2	Students will be able to: <ul style="list-style-type: none"> • Distinguishing the unique characteristics of the modern problems of world regions • Characterization of world regions using different materials • Analyzing modern social problems of the world and showing solutions 	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		The most important global environmental problems of humanity	
2		Global environmental crises	
3		Ecological nature of peace and disarmament problems of humanity	
4		Environmental consequences of demographic problems	
5		Ecological regulation of human food problems	
6		The ecological nature of solving the world's energy and raw material problems	
7		Radioactive contamination problem and prediction	
8		Ecological consequences of global climate changes	
9		Deforestation is a global environmental problem. Deforestation problems in Azerbaijan	
10		Global desertification problems	
11		Global environmental problems of the world ocean	
12		The problem of protecting biological diversity	
13		Ecogeographic consequences of space processes	
14		World health problems	
15		The global environmental nature of drug addiction and terrorism	

Recommended Sources

TEXTBOOK(S)

- Azizov B.M., Abbaszade A.A. Fundamentals of aerospace research. Baku, 2004.
- Goychaylı Sh.Y. Problems of geography and geographic ecology. Baku, 2004.
- Goychaylı Sh.Y., İsmayilov T. Economic and ecological bases of nature use. Baku, 2006.
- Koshkina E.A. Spector Sh.I. and others. Medical, social and economic consequences of drug addiction and

alcoholism. Per. Moscow, 2008, 288

- Goychayl Sh.Y. Basics of geographic ecology. Baku, 2010
- Khalilov Sh.B. Ecogeographical problems of Azerbaijan. Baku, 2006, 160 p.
- Desertification problems in Azerbaijan. Acad. Materials of the scientific-practical conference dedicated to the 75th anniversary of B.A. Budagov's birth. Baku, 2003.
- Babayev M.P., Gurbanov E.A. Study of desertification-land degradation (methodical recommendation). Baku: Elm, 2008, 47 p.
- Global environmental problems in the world. January 2020 E3S Web of Conferences 217(58):11004, Galina Semenova
- Global environmental issues. MODULE - 4 Contemporary Environmental Issues
- GLOBAL ECOLOGY R. J. Huggett Reader in Geography, University of Manchester, Manchester, UK. ECOLOGY - Vol. I - Global Ecology - R. J. Huggett

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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			5

MODULE HANDBOOK**Ecology bachelor program, Department of "Ecology and Environment".**

Course Unit Title	Ecology of the lithosphere	
Course Unit Code	ATMF-B08	
Type of Course Unit	Selected	
Level of Course Unit		
National Credits		
Number of ECTS Credits Allocated	5	
Theoretical (hour/week)	1	
Practice (hour/week)	0.5	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered		
Course Coordinator		
Name of Lecturer (s)		
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azərbaycan İngilis Rus	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
The subject "Ecology of the Lithosphere" is a subject that studies the ecological processes occurring in the Earth's crust (lithosphere), the impact of human activity on the soil and geological environment, the consequences of these impacts, and ways to prevent them. This subject stands at the intersection of geology, ecology, environmental protection, and sustainable use of natural resources.		
Objectives of the Course:		
The subject "Ecology of the Lithosphere" is a subject that studies the ecological processes occurring in the Earth's crust (lithosphere), the impact of human activity on the soil and geological environment, the consequences of these impacts and ways to prevent them. This subject stands at the intersection of the fields of geology, ecology, environmental protection and sustainable use of natural resources. To provide students with extensive information about the composition and structure of the lithosphere, natural and anthropogenic processes occurring on it, pollution of the soil and geological environment, soil erosion, geohazards (earthquakes, landslides, etc.) and the ecological consequences of these problems.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	<ul style="list-style-type: none"> – Can explain the composition and structure of the lithosphere on scientific grounds. – Analyzes natural and anthropogenic processes occurring in the lithosphere and evaluates their ecological consequences. – Determines the importance of soil resources and degradation processes. 	
2	<ul style="list-style-type: none"> – Can explain the sources of pollution of the lithosphere and the impact of this pollution on living things and the ecosystem. – Evaluates geological risks (earthquakes, landslides, etc.) as ecological threats and suggests ways to prevent them. 	
3	<ul style="list-style-type: none"> – Able to apply modern approaches to environmental protection and sustainable use of land resources. 	

	– Demonstrates a responsible attitude towards nature and the ability to make decisions based on ecological thinking.		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		Introduction and concepts to the ecology of the lithosphere.	
2		Geological structure of the earth's crust and its main components.	
3		Natural processes occurring in the lithosphere.	
4		Land cover and its ecological role.	
5		Anthropogenic impacts and soil degradation.	
6		Soil erosion and methods of control.	
7		Sources of pollution and forms of soil pollution.	
8		Impact of the oil and gas industry on the lithosphere.	
9		Heavy metals and radiation: threats to the soil.	
10		Geological risks and their ecological consequences.	
11		Technogenic landscapes and land use change.	

12		Ways to protect and restore soil resources.	
13		Climate change and soil ecosystems.	
14		Monitoring and assessment of soil and lithosphere.	
15		Regional and global challenges on ecological problems of the lithosphere.	

Recommended Sources

TEXTBOOK(S)

- Alizade A.E. – Introduction to Earth Science. Baku: “Elm”, 2000.
- Alizade A.E., Hasanov V.M. – Physical Geography of Azerbaijan. Baku: Baku University, 2005.
- Guliyev H.H., Aliyev F.A. – Soil Science and Protection of Soil Resources. Baku: ADPU, 2008.
- Novruzov E.M., Ismayilov A.F. – Ecology and Environmental Protection. Baku: Education, 2013.
- Kochurov B.I. – Ecology of the lithosphere. Moscow: Logos, 2001.
- Strahler A., Strahler A. – Introducing Physical Geography. Wiley, 2014.
- Botkin D.B., Keller E.A. – Environmental Science: Earth as a Living Planet. Wiley, 2011.
- Montgomery C. – Environmental Geology. McGraw-Hill, 2006.
- Lutgens F.K., Tarbuck E.J. – The Dynamic Earth: An Introduction to Physical Geology. Pearson, 2017.
- UNEP (United Nations Environment Programme) – www.unep.org
- FAO (Food and Agriculture Organization) – *Soil and land resources* bölməsi: www.fao.org
- NASA Earth Observatory – *Land & Soil Topics*: earthobservatory.nasa.gov

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			240

Total Workload/30(h)	240/30
ECTS Credit of the Course	5

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and Environment".

Course Unit Title	Natural disasters and their elimination	
Course Unit Code	ATMF-B08	
Type of Course Unit	Selection	
Level of Course Unit		
National Credits		
Number of ECTS Credits Allocated	5	
Theoretical (hour/week)	1	
Practice (hour/week)	0.5	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered		
Course Coordinator	Aruz Mikayilov	
Name of Lecturer (s)	Aruz Mikayilov	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani, English, Russian	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
<p>This subject provides students with fundamental knowledge about the types of natural disasters, their causes, their impact on human activity and the environment, as well as ways to prevent and eliminate the consequences of these disasters. Within the framework of the subject, major natural disasters such as earthquakes, floods, landslides, droughts, forest fires, and volcanic eruptions are studied in detail.</p> <p>The educational process includes both theoretical and practical approaches. Students are introduced to risk assessment, preparation of evacuation plans, rules of conduct during emergencies, and modern management technologies. The subject also touches on the issues of building societies that are resilient to natural disasters in terms of sustainable development and the formation of a safe living environment.</p>		
Objectives of the Course:		
<p>The main objective of the subject is to provide students with scientific knowledge about the causes, classification and impacts of various natural disasters on society, as well as to instill practical skills on ways to prevent these disasters and eliminate their consequences. The aim is to teach students basic knowledge on risk assessment, disaster preparedness, emergency management principles and recovery planning. The subject also serves to form sustainable approaches to natural disasters in the context of human security, sustainable development and ecosystem protection.</p>		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Can explain the types, causes and classification of natural disasters;	

	Can analyze the effects of natural disasters on human life, environment and infrastructure.	
2	Able to assess risks and identify ways to reduce disaster risks. Able to apply disaster preparedness and emergency response strategies.	
3	Has the ability to plan post-disaster recovery and reconstruction processes; Has the ability to apply the acquired knowledge in practical situations (simulation, analysis, presentation, etc.).	
4	Can evaluate ways to form societies and safe living environments that are resilient to natural disasters.	

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

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

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

Course Contents

Week	Chapter	Topics	Exam
1		Theoretical methodological foundations and significance of studying natural disasters.	
2		Classification of natural disasters and methods of studying them.	
3		Earthquakes, volcanoes and tsunamis, elimination of their	

		consequences.	
4		Avalanches and landslides. Fight against them and elimination of their consequences.	
5		Floods, floods and submersions. Fight against them and elimination of their consequences.	
6		Movement of glaciers, avalanches. Their consequences and elimination.	
7		Temperature anomalies. Torrential rains and drought. Their consequences and protection.	
8		Lightning, hail, frost, destructive and harmful winds. Their consequences and elimination.	
9		Natural disasters of cosmic origin. Their consequences and protection methods	
10		The impact of natural disasters on ecosystems.	
11		The impact of natural disasters on the territorial organization of tourism and transport-communication systems and their management.	
12		The impact of natural disasters on the territorial organization of settlements and agriculture, their management.	
13		Impact and management of natural disasters on the territorial organization of tourism and transport-communication systems.	
14		Impact and management of natural disasters on the territorial organization of the industrial complex.	
15		Ecological, socio-economic problems caused by natural disasters and insurance against them. Assessment of the risk of natural disasters.	

Recommended Sources

TEXTBOOK(S)

- Mahmudov R.N. Hydrometeorology, climate change, natural disasters and life. Baku: Ziya-Nurlan-2006,-76 p.
- Hamzayev G. A. Natural disasters. Baku: ADPU-2008, -67 p.
- Babakhanov N. A. Geography of natural disasters: theoretical and methodological foundations. Baku: Kooperasiya- 2016, -111 p.
- Shukurov R. E. Physical and economic-geographical analysis of natural disasters on the northeastern slope of the Lesser Caucasus. Baku: ULU- 2017, -101 p.
- Aliyeva S. G. The impact of natural-destructive events on settlement in the Kur-Araz lowland. Baku: Europe-2018, -214 p.
- Gasimova E.E. Geography of natural disasters. Baku: Optimist LLC-2022, -239 p.
- Habibov F. H., Hasanov S. T., Habibova L. F. Engineering protection against natural hazards. Baku: MSV Publishing House.- 2022, -649 p.
- Pashayev N. A. Economic-geographical assessment of the impact of natural disasters on the economy in the Republic of Azerbaijan. Baku: Europe- 2018, -370 p.
- Mammadov G.Sh., Khalilov M.Y. Ecology, environment and man. Baku: Elm,- 2006,- 608 p.
- Museyibov M. A., Budagov B. A., Shirinov N. Sh. General geomorphology. Baku: Baku University,- 2012,- 303 p.
- Safarov H.S. General meteorology. Baku: Ziya,- 2014,- 351 p.
- Sladkopevtsev S. A. Earth Science and Nature Management. Moscow: Vysshaya shkola, - 2005, - 357 p.
- Koronovsky N. V., Bryanceva G. V. Dangerous Natural Processes. Moscow: INFRA-M, -2017, -231 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		
<ul style="list-style-type: none"> • 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		240
Total Workload/30(h)		240/30
ECTS Credit of the Course		5

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and environment".

Course Unit Title	Ecochemical processes in the atmosphere
Course Unit Code	ATMF-B09
Type of Course Unit	Selection
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	5
Theoretical (hour/week)	1
Practice (hour/week)	0.5
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Ulkar Gadiyeva
Name of Lecturer (s)	Ulkar Gadiyeva

Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijani	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description: The subject of Ecochemical Processes in the Atmosphere is a field that studies the interactions between chemical and biological processes occurring in the atmosphere and the effects of these processes on ecosystems. This subject covers the changes in the chemical composition of the atmosphere, the metabolism of toxic substances in the air, the biological cycle, and the processes that try to maintain the natural balance of the atmosphere.		
Objectives of the Course: The aim of the discipline of Ecochemical Processes in the Atmosphere is to understand the chemical and biological processes in the atmosphere and other ecosystems and to assess the impact of these processes on nature and humans. It is also an important field for the protection of ecosystems and the fight against global climate change.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	The discipline of Ecochemical Processes in the Atmosphere leads to a number of important results and benefits. These results are important both in terms of the development of scientific research, as well as in terms of protecting the environment and improving the quality of life of people. - Understanding Climate Change: Measures against climate change are developed by studying the cycle of gases in the atmosphere and the causes of global warming.	
2	-Air Pollution Reduction: The causes and effects of air pollution are identified and measures are implemented to reduce pollution. -Ozone Layer Protection: Chemical processes related to ozone layer damage are studied and protection measures are strengthened. -Ecosystem Resilience: Chemical and biological processes of ecosystems are studied and their resilience is increased. -Nature Restoration: Effective methods are developed for the restoration of polluted areas.	
3	– New Technologies: New technologies are being developed, such as filtering harmful substances and capturing carbon dioxide. – Protecting Human Health: The effects of pollution on human health are being studied and measures are being taken to improve the environment. – Global Environmental Policies: International cooperation is being strengthened to solve environmental problems. – Biological Diversity Conservation: Strategies are being developed to protect biological diversity.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Chemical Composition of the Atmosphere and Air Pollution.	
2		Climate Change and the Role of Greenhouse Gases in the Atmosphere.	
3		Climate Change and the Role of Greenhouse Gases in the Atmosphere.	
4		Biogeochemical Cycles and Impact on Ecosystems.	
5		Distribution of Pollutants in Ecosystems.	
6		Distribution of Pollutants in Ecosystems.	
7		Carbon Cycle and Climate Change.	
8		Nitrogen Cycle and Atmospheric Chemistry.	
9		Industrial Pollution and Air Quality.	
10		Accumulation of Chemical Substances in Nature and Impact on Ecosystems.	
11		Impact of Air Pollution on Human Health.	
12		Technologies for Reducing Toxic Substances in the Atmosphere.	
13		Reactions and Impacts of Sulfur Dioxide in the Atmosphere.	
14		Impact of Ammonia and Nitrogen Oxides in the Atmosphere on Ecosystems.	
15		Ways to Successfully Reduce Carbon Dioxide Emissions.	
16		Chemical Composition Changes and Ecological Balance in	

		Ecosystems.	
17		Chemical Composition of the Atmosphere and Air Pollution.	
Recommended Sources			
TEXTBOOK(S)			
<ul style="list-style-type: none"> – Mammadov, R. (2012). Chemical composition and ecology of the atmosphere. Baku: Science and Education. – Aliyev, S. (2015). Climate change and its impact on ecosystems. Baku: East-West Publishing House. – Rahimov, A., & Guliyev, T. (2010). Ecological chemistry and biogeochemistry. Baku: University Publishing House. – Chemical Pollution and Ecosystems: Human's Impact on Nature - Hall, D. W. – Hasanov, F., & Ismayilov, M. (2018). Atmospheric pollution and its modern problems. Baku: Education – Schneider, M., & Houghton, R. A. (2007). Atmospheric Chemistry and Global Change. Oxford University Press. – Seinfeld, J. H., & Pandis, S. N. (2016). Atmospheric Chemistry and Physics: From Air Pollution to Climate Change (3rd ed.). Wiley. – Caldeira, K., & Wickham, L. (2015). The Climate Crisis: An Introductory Guide to Climate Change. Oxford University Press. – Galloway, J. N., & Cowling, E. B. (2002). Reactive Nitrogen in the Environment: Too Much of a Good Thing. 			
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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			4

MODULE HANDBOOK**Ecology bachelor program, Department of "Ecology and environment".**

Course Unit Title	Chemical pollution of the biosphere.	
Course Unit Code	ATMF-B09	
Type of Course Unit		
Level of Course Unit		
National Credits		
Number of ECTS Credits Allocated	4	
Theoretical (hour/week)	1	
Practice (hour/week)	0.5	
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered		
Course Coordinator	Ulkar Gadiyeva	
Name of Lecturer (s)	Ulkar Gadiyeva	
Name of Assistant (s)	-	
Mode of Delivery	Face to face	
Language of Instruction	Azerbaijan, English, rus	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description: The subject "Chemical Pollution of the Biosphere" is a course in environmental sciences that studies chemical pollution processes that occur mainly in the biosphere (i.e., the layer on Earth inhabited by living things). This subject is of great importance both in terms of protecting the natural environment and assessing the impacts of human activity on the environment.		
Objectives of the Course: To teach students about chemical pollution processes occurring in the biosphere, their causes, consequences, and ways to prevent this pollution. At the same time, to form an ecological mindset in students and provide practical knowledge on environmental protection.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	<ul style="list-style-type: none"> – Students will be able to identify the different types of chemical pollution occurring in the biosphere (pollution in the atmosphere, water, soil and biotic components). They will be able to understand the effects of chemicals on ecosystems and the dangers of this pollution for living things. – -Students will recognize the types of chemical pollutants (heavy metals, pesticides, industrial waste, etc.) and understand the ways in which these substances are released into nature. – -They will be able to analyze the sources of pollutants (industrial activities, agriculture, transportation, etc.). 	
2	<ul style="list-style-type: none"> – Students will understand the changes that pollution causes in ecosystems (especially aquatic and terrestrial ecosystems) and in the health of organisms. – -They will gain an understanding of the ecological cycle of chemical pollution (bioaccumulation, biodiversity loss, etc.). 	

	– -Students will analyze the effects of chemical pollution on human health (chronic diseases, poisoning, genetic changes, etc.).	
3	– They will assess the health risks associated with pollution and learn ways to manage these risks. – -Students will apply analytical techniques to conduct environmental monitoring and assess levels of chemical pollution.	
4	– They will understand the importance of environmental cleanup and protection measures by evaluating the sources and effects of pollution. – Students will gain knowledge about clean technologies, environmentally friendly products, and alternative energy sources, and will learn the methods that can be applied in these areas. – They will be able to evaluate the role of the state and public sector in pollution prevention by studying environmental legislation and regulatory documents.	
5		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents			
Week	Chapter	Topics	Exam
1		Chemical pollution and its impact on nature.	
2		Types of chemical pollution.	
3		Types of chemical pollution.	
4		The cycle of chemicals in the biosphere.	
5		Distribution of pollutants in ecosystems.	
6		The impact of chemical pollution on the main components of the biosphere.	
7		The impact of chemical pollution on health.	
8		Prevention and treatment methods of chemical pollution.	
9		Monitoring and assessment of chemical pollution.	
10		Legislative and ethical aspects of chemical pollution.	
11		Management and restoration of contaminated sites.	
12		Global ecological impacts of chemical pollution.	
13		The impact of pesticides and chemical fertilizers on ecosystems and productivity.	
14		Methods of remediation of chemical pollution and ecological restoration of contaminated sites.	
15		Individual measures to be taken by people to prevent chemical pollution.	
<p>Recommended Sources TEXTBOOK(S)</p> <ul style="list-style-type: none"> - Odum, E. P. "Ecology and Ecosystems" - Mammadov, T. A. "Chemical Pollution and Its Impact on the Environment" - Boyd, J. W. "Pollution and Ecosystem Services" - Hall, D. W. "Chemical Pollution and Ecosystems: Human's Impact on Nature" - Hasanov, M. S. "Pollution and Environmental Protection" - Manahan, S. E. "Environmental Chemistry" - Petty, R. L. "Managing Pollution Impact" - Jafarov, I. B. "Chemical Pollution of the Biosphere and Its Prevention" - Hasanov, F. K. "Ecosystems and Pollution" 			
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			
<ul style="list-style-type: none"> • 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. 			

<ul style="list-style-type: none"> 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			4

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and environment".

Course Unit Title	Ecosystems and toxicants
Course Unit Code	ATMF-B09
Type of Course Unit	Selection
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	4
Theoretical (hour/week)	1
Practice (hour/week)	0.5
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Leyla Cavadova
Name of Lecturer (s)	Leyla Cavadova
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-
Course description: The subject of "Ecosystems and Toxicants" is a science that studies the structure of ecosystems, the mechanism of their functioning, and the effects of toxicants (harmful chemicals) on these systems. Within the scope of the subject, the interrelationships between living organisms and the environment in which they live, and the effects of toxic substances entering or formed in this environment	

on living organisms, the sustainability of ecosystems, and the biosphere are analyzed.		
Objectives of the Course:		
<ul style="list-style-type: none"> – Explain the concept and structure of the ecosystem. – Teach the classification of the origin of toxicants. – Understand the effects of toxicants on living organisms and ecosystems. – Assess the ecological hazards of toxicants. – Form approaches to environmental protection. – Develop a sense of ecological awareness and responsibility in students. 		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	<p>The learning outcomes of the subject include the knowledge, skills and approaches that the student will acquire after completing this course. A student who completes this subject will:</p> <ul style="list-style-type: none"> – Be able to explain the structure and mechanism of action of ecosystems – Be able to identify the types and origin of toxicants. – Be able to explain the mechanism of action of toxicants on living organisms and ecosystems. – Be able to analyze the ecological problems caused by toxic substances in ecosystems. – Be able to apply methods of assessing and monitoring ecological risks. 	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		Introduction to ecology and the concept of ecosystem.	
2		Types and characteristics of ecosystems.	
3		Energy flow and material cycling.	
4		Overview of toxicants.	
5		Classification and properties of toxicants.	
6		Ways of toxicants entering the environment.	
7		The movement of toxicants in living organisms.	
8		Biomagnification and its impact on ecosystems.	
9		Assessment of toxicological risks.	
10		Mechanisms of action of ecotoxicants.	
11		Toxic pollution of the environment and its consequences.	
12		Ecotoxicological monitoring and analysis methods.	
13		Ways of restoration and neutralization of natural ecosystems.	
14		Environmental protection and sustainable development.	
15		Summary of the subject: analysis and discussion of problem situations.	
Recommended Sources			
TEXTBOOK(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			
<ul style="list-style-type: none"> • 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	240		
Total Workload/30(h)	240/30		
ECTS Credit of the Course	4		

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and environment”.

Course Unit Title	Landscape-ecological conditions of the Absheron Peninsula.
Course Unit Code	ATMF-B10
Type of Course Unit	Selection
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	1.5
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Aruz Mikayilov
Name of Lecturer (s)	Aruz Mikayilov
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani,English,Rus
Prerequisites	-
Recommended Optional Program Components	-
Course description:	
<p>This course is one of the current topical courses. The importance of the course is that 40 percent of the population of Azerbaijan lives on the Absheron Peninsula. It is the area of the highest anthropogenic load in the republic. In this regard, the course, characterized by topical landscape-ecological topics, will expand students' knowledge of all natural and natural-anthropogenic, anthropogenic geosystems of the landscape sphere of the Absheron Peninsula, their ecological conditions.</p>	
<p>Objectives of the Course: Landscape science is a synthesis of all natural sciences, closely related to geology, geochemistry, geophysics, soil science, climatology, geomorphology. The main synthesis processes are related to ecology. The main goal of the course is to study the landscapes of the Absheron Peninsula, their formation, development, modern state, degree of anthropogenization and ecological conditions, the characteristics of the factors affecting them, as well as ways to solve and assess environmental problems.</p>	

Learning Outcomes			
At the end of the course the student will be able to			Assessment
1	<ul style="list-style-type: none"> - Formation of ideas about the goals and objectives of landscape science, scientific research methods, and its relationship with other sciences; - Formation of ideas about landscape-ecological research; - Formation of ideas about the physical and geographical conditions of the Absheron Peninsula; - Formation of ideas about the main ecological conditions of the Absheron Peninsula; - Formation of ideas about the landscape conditions of the Absheron Peninsula and its ecological conditions. 		
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz			
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control		
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations		
6	ability to use various types of devices to monitor and control technological processes		
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		
8	ability to use modern information technologies and software, observing information security requirements in their professional activities		
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		
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		
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		The purpose, object, subject of the course on landscape ecological conditions of the Absheron Peninsula.	

2		Landscape components of the Absheron Peninsula. Geomorphological features and their role in landscape formation.	
3		Climatic features of the Absheron Peninsula and their role in landscape formation.	
4		Climatic features of the Absheron Peninsula and their role in landscape formation.	
5		Soil and vegetation cover of the Absheron Peninsula and their role in landscape formation.	
6		Main features and differentiation of modern landscapes of the Absheron Peninsula.	
7		Anthropogenic transformation of the landscapes of the Absheron Peninsula.	
8		Main ecological problems of the landscapes of the Absheron Peninsula.	
9		The role of natural factors in the formation of ecological problems of the landscapes of the Absheron Peninsula. The influence of climate and arid-denudation processes.	
10		The role of the Caspian Sea level fluctuation and mud volcanoes in the formation of ecological problems.	
11		The role of anthropogenic factors in the emergence of ecological problems of the landscapes of the Absheron Peninsula. The impact of mining industries. Ecological state of landscape areas where oil is extracted.	
12		Ecological problems of household waste and livestock farming.	
13		The main desertification factors and desertification state of the landscapes of the Absheron Peninsula.	
14		Pollution of the Absheron coast of the Caspian Sea with oil and oil products, its ecological consequences.	
15		Methods of restoration of polluted landscapes on the Absheron Peninsula.	
16		Ecological features of the paleolandscape of the Absheron Peninsula.	
17		Combating factors of landscape degradation on the Absheron Peninsula.	
18		Ecological assessment and monitoring of the landscapes of the Absheron Peninsula.	
19		Optimization of the landscapes of the Absheron Peninsula.	

Recommended Sources

TEXTBOOK(S)

- Aghayev Sh.B., Afkarov G.Kh. Degraded and contaminated soils of the Absheron peninsula, their formation, reclamation problems. Baku, 2007, 33 p.
- Akhundova A.B., Mughanlinskaya Y.A. Recommendations for the study and mapping of the degree of soil contamination with heavy metals. Baku, 2001, 13 p.
- Aslanov H., Safarli S. "Azerbaijani oil-contaminated soils, their reclamation and utilization" B. 2008, 193 p.
- Aslanov H.Q. Ecological characteristics of oil-contaminated soils in Absheron. «Problems of seismic and seismic stable construction and Architecture» BK materials, Baku, 2005., 386-389 p.
- Mammadov G.Sh. Hekimova N.F. Ecological fertility model of oil-polluted soils. Baku, «Elm», 2003, 50 p.

- Aliyev B.H. Management of summer and winter pastures of Azerbaijan. Baku, «Ziya-Nuran», 2007, 510 p.
- Khalilov M.Y. Anthropogenic change and restoration of vegetation cover. Constructive geography of the Republic of Azerbaijan. Baku, «Elm», 2000, p 131-159.
- Ismayilov N.M. Cleaning of oil-polluted soils and drilling cuttings. Baku, «Tehsil» NPM, 2007, 168 p.
- Mammadov G.Sh. Ecological assessment of Azerbaijani soils. Baku, «Elm», 1998, 281 p
- Mammadov G.Sh. Soil resources of Azerbaijan. Baku, «Elm», 2001, 132 p.
- Yagubov G.Sh. Study of technogenically - degraded soils of the Republic of Azerbaijan, genetic characteristics and ways of their reclamation. Baku, 2003, 205 p.
- Khalilova H.Kh. Pollution of the ecosystem with harmful wastes on the Absheron peninsula and study of methods for their elimination. Abstract. B. 2003, p. 63.
- Huseynli N. I. Modern landscapes and ecological problems of the Absheron peninsula Abstract. B., 2009. 22 p
- Mamedov A.V. Shirinov N.Sh. Geological structures of the Absheron Peninsula. In the book "Natural conditions and resources of Absheron". Elm Publishing House, Baku, 1979, 179 p.
- Mamedov G.Sh., Guliyev A.M. Disturbed and contaminated soils of the Absheron Peninsula and ways of their restoration // News of agrarian science, - 2009. - No. 4. - pp. 57-59. 90
- Talybov A.T. Cartographic analysis of landscape and environmental conditions of the Absheron Peninsula. Baku: Chashigoglu. 2004. - 192
- Shirinov N.Sh. Geomorphology of the Absheron oil-bearing region. Baku: Publishing House of the Academy of Sciences of the Azerbaijan SSR, 1965, pp. 109-122.
- Islamov C.I. Landscape zoning of the Absheron Peninsula // News of the Academy of Sciences of the Azerbaijan SSR. Earth Sciences Series, 1973, No. 3, pp. 16–22.

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			240

Total Workload/30(h)	240/30
ECTS Credit of the Course	6

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and environment".

Course Unit Title	Safety of food products.
Course Unit Code	ATMF-B10
Type of Course Unit	Selection
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	1.5
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Lala Guliyeva
Name of Lecturer (s)	Lala Guliyeva
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani,English, Rus
Prerequisites	-
Recommended Optional Program Components	-

Course description:

Welcome to the Food Safety course, one of the subjects of our education. In the technologies for preparing safe, ecologically clean food products, the ecological safety, quality and compositional indicators of raw materials, the efficiency of production processes, the compliance of the produced food products with the established norms - that is, the requirements of the relevant Standard, and the fulfillment of sanitary and hygienic requirements are of great importance. It is impossible to achieve high quality indicators at the modern level without knowing the methodological foundations. The teaching of the subject is closely related to such subjects as ecology, physics, chemistry, biochemistry, microbiology, toxicology, standardization and certification, expertise, mathematics and marketing. The development and improvement of market relations, the solution of the problems of contamination of food products with foreign substances of ecological, chemical and biological origin are impossible without highly qualified specialists. Therefore, throughout the course, we will learn to study issues that meet the requirements of the modern era, and to control their quality and quantity in the process of their preparation, acceptance and distribution in accordance with regulatory documents. In the technologies for the preparation of various types of food products that are safe, environmentally friendly and free from harmful components for the human body, the quality and composition of raw materials, the efficiency of production processes, environmental safety, compliance of manufactured products with established norms - that is, the requirements of the relevant Standard, and the fulfillment of sanitary and hygienic requirements are of great importance. The solution of all the listed issues requires knowledge of the methods of research of food raw materials and finished food products. This field of science involves the creation of new principles

and methods of food systems, as well as the determination of the structure of individual substances included in the composition of food products, their functions and interactions with other components.

Objectives of the Course: During the study of the subject:

- learning how to provide food products with high quality indicators;
- ensuring the production of a variety of food products that are safe, clean and free of harmful components for the human body;
- learning the basics of purchasing environmentally safe plant and animal products;
- food safety. physical and economic availability of food for consumers;
- familiarization with the main regulatory and legal documents on modern management systems in the field of food safety

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	As a result of mastering the subject, students should know: As a result of mastering the subject, students should know: to use normative and legal documents in their work activities. to produce products belonging to various food product groups. to know the range of food products, the factors that form and maintain their quality. to know and possess the methods of food product identification, quality and safety assessment. to be able to detect falsifications, poor-quality and dangerous products, and to diagnose defects. to be able to use ICT and electronic resources in sections and topics, to prepare various electronic teaching materials and presentations.	

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

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

8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Introduction. Fundamentals of ecologically safe food production.	
2		Ecologically safe crop production.	
3		Ecologically safe livestock production.	
4		Nutritional value of food products.	
5		Biological value of food products.	
6		Epidemiological safety of food products.	
7		Toxicological safety of food products.	
8		Nutritional value, biological value and safety of grain, flour, cereals and bakery products.	
9		Nutritional value, biological value and safety of fruit and vegetable products.	
10		Nutritional value, biological value and safety of meat and meat products.	
11		Nutritional value, biological value and safety of milk and dairy products.	
12		Nutritional value, biological value and safety of fish and fish products.	
13		Genetically modified food products.	
14		Food additives and their safety.	
15		Biologically active additives and their safety.	

Recommended Sources

TEXTBOOK(S)

- Maharramov M.A., Maharramova M.H., Kazimova I.H., Maharramova S.I. Practicum (teaching material) about safety of raw materials and food products. Baku: "Economics University" Publishing House, 2018. -148 p.
- Farzaliyev E. B. Modern research methods of food products, "Iqtisad University" publishing house, Baku 2014, 365 p. p.
- Donchenko, L. V. Food Safety. In 2 parts. Part 1: textbook for universities / L. V. Donchenko, V. D. Nadykta. - 3rd ed., corrected. and add. - Moscow: Publishing house Yurait, 2023. - 264 p. - (Higher education).
- ISBN 978-5-534-05915-1. - Text: electronic // Educational platform Yurait [website]. - URL: <https://urait.ru/bcode/513321> (date of access: 02/13/2023).

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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			6

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and environment”.

Course Unit Title	Environmentally friendly products
Course Unit Code	ATMF-B10
Type of Course Unit	Selection
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	1.5
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Lala Guliyeva
Name of Lecturer (s)	Lala Guliyeva
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani, English, Rus
Prerequisites	-

Recommended Optional Program Components		-
<p>Course description: In order to produce safe, environmentally friendly and also free of harmful components for the human body, various types of non-food products, the quality and composition of raw materials, the efficiency of production processes, environmental safety, compliance of manufactured products with established norms - that is, the requirements of the relevant Standard, and the fulfillment of sanitary and hygienic requirements are of great importance in the technologies for the preparation of these products. The solution of all the listed issues requires knowledge of the methods of research of non-food raw materials and finished food and non-food products. This field of science involves the creation of new principles and methods of non-food systems, as well as the determination of the structure of individual substances included in the composition of non-food products, their functions and interactions with other components.</p>		
<p>Objectives of the Course: During the study of the subject:</p> <ul style="list-style-type: none"> - learning how to ensure the production of food and non-food products with high quality indicators; - ensuring the production of a variety of food and non-food products that are safe, clean, and free of harmful components for the human body; - learning the basics of purchasing environmentally safe plant and animal products; - food safety - physical and economic availability of food for consumers; - familiarization with the main regulatory and legal documents on modern management systems in the field of food and non-food product safety. 		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	<p>As a result of mastering the subject, students should know:</p> <ul style="list-style-type: none"> - how to use regulatory and legal documents in their work activities; - the production technology of products belonging to various groups of food and non-food products; - the assortment and consumer properties of goods, the factors that form and maintain their quality; - know the methods of identification, quality and safety assessment of goods and apply this knowledge to detect falsifications, poor-quality and dangerous products, and diagnose defects; - use ICT and electronic resources in sections and topics, prepare various electronic teaching materials, and presentations. 	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	

5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Introduction. Fundamentals of safe food and non-food production.	
2		Ecologically safe crop production and safe livestock breeding.	
3		Nutritional value and biological value of food products.	
4		Epidemiological and toxicological safety of food products.	
5		Nutritional value, biological value and safety of grain, flour, cereals and bakery products.	
6		Nutritional value, biological value and safety of fruit and vegetable products.	
7		Nutritional value, biological value and safety of meat and meat products.	
8		Nutritional value, biological value and safety of milk and dairy products.	
9		Nutritional value, biological value and safety of fish and fish products.	
10		Food additives, biologically active additives and their safety.	
11		Genetically modified food products.	
12		Safety of detergents and household chemicals.	
13		Construction and building materials and their safety.	
14		Safety of cultural and household goods.	
15		Safety of knitted and leather goods.	

Recommended Sources

TEXTBOOK(S)

- Farzaliyev E. B. Modern methods of research of food products, "University of Economics" publishing house, Baku 2014, 365 p.
- Movsumov E.E., Yusifov N.M. Food chemistry. Baku, MBM, LLC, 276 p.
- Rogov I.A., Antipova L.V., Dunchenko N.I., Zherebtsov N.A. Food chemistry. - M.: Kolos, 2000. 384 p.
- Y.A. Zolotov, E.N. Dorohova, V.I. Fadeeva et al. Edited by Y.A. Zolotov. (Translated) Fundamentals of analytical chemistry. 2 books. Book 1. General questions. Separation methods. M.: 1999. – 436 p.
- Y.A. Zolotov, E.N. Dorohova, V.I. Fadeeva et al. Edited by Y.A. Zolotov. (Translated) Fundamentals of analytical

chemistry. 2 books. Book 2. Chemical analysis methods. M.: 1999.– 574 p. - Hasanova S.I., Hashimov X.M. Food chemistry. – Baku.: Iqtisad University Publishing House, 2010. – 478 p. - Mikayilov V.Sh. Food tasting. Baku.: Kooperasiya Publishing House, 2012. – 384 p. - Mustafayev F.A., Rustamov E.A. Laboratory examinations of food products. – Baku.: Elm, 2010. – 448 p. p.Базарнова Yu.G. Methods of studying raw materials and finished products. – St. Petersburg: Publishing House of St. Petersburg State University, 2013. – 76 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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			6

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and environment”.

Course Unit Title	Organization of waste-free production processes.
Course Unit Code	ATMF-B11
Type of Course Unit	Mandatory
Level of Course Unit	

National Credits		
Number of ECTS Credits Allocated		7
Theoretical (hour/week)		1.5
Practice (hour/week)		1
Laboratory (hour/week)		
Year of Study		
Semester when the course unit is delivered		
Course Coordinator		Ulviyya Karimova-Jafarova
Name of Lecturer (s)		Ulviyya Karimova-Jafarova
Name of Assistant (s)		-
Mode of Delivery		Face to face
Language of Instruction		Azerbaijani
Prerequisites		-
Recommended Optional Program Components		-
<p>Course description: One of the main goals of the subject "Organization of Waste-Free Production Processes" is to teach future specialists how to find solutions to these problems by studying the waste generated in various industrial sectors, the chemical composition of this waste, and the negative effects it may have on the environment.</p>		
<p>Objectives of the Course: As is known, the most dangerous situation for people in terms of environmental protection and its components occurs when the environment is polluted by waste from industrial enterprises. Thus, waste substances released into the environment in large quantities, along with a number of complications, lead to an increase in non-epidemic, primarily oncological diseases among people. As a result of the conducted research, it became clear that pollution with waste occurs through the release into the environment of a number of chemical elements, including uranium, thorium, radium, californium, transuranium and many other such radioactive substances, as well as gas, liquid and solid wastes of chemical and petrochemical enterprises. The subject "Organization of waste-free production processes" teaches scientific and technical means of solving the problem of environmental protection, in particular the purpose, constructive structures and principles of work of creating new low-waste and waste-free technologies.</p>		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	By studying the subject, students will not only be able to clarify and determine the environmental problems created by various industrial enterprises and the damage caused by these problems, but will also acquire the skills to eliminate these problems in more efficient ways.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Ecological aspects of waste management.	
2		Waste generation and classification.	
3		Waste utilization (utilization) - as a basis for resource conservation.	
4		Transportation of industrial waste.	
5		Technological processes used in waste management.	
6		Thermal treatment and disposal of waste.	
7		Metal waste management.	
8		Utilization of slag, ash, refractory materials and burnt soil.	
9		Processing of polymer waste.	
10		Processing of textile waste.	
11		Processing of wood waste.	
12		Processing of petroleum waste.	
13		Use of wastepaper.	
14		Processing of some liquid waste.	
15		Recycling of household waste.	

Recommended Sources

TEXTBOOK(S)

- A.A.Mammadov, A.A.Khalilova. "Industrial ecology", Baku 2002.
- N. A. Salimova, F. M. Sultanova. "Protection of water and air basins from harmful wastes of industrial enterprises." Baku 2004.
- A.A.Khalilov, R.M.Khasayev, A.M.Alasgarov, G.A.Nasibova. "Fundamentals of industrial ecology." Baku 1997.
- Sh.Y.Goychayli, B.M.Azizov. "Environmental protection." Baku 2008.
- J.M.Mahmudov. "Technology and industrial ecology of production areas." Baku 2001.
- Abdullayev K.M, Shahmarov S.A. "Protection of the environment from wastes of thermal and nuclear power plants." Baku 1992

- S.A.Novruzov. "General chemical technology and industrial ecology." Baku, 1991.
- A.Novruzov "General chemical technology and industrial ecology" 384 p. 1991.
- J.M.Mahmudov "Technology of production areas and industrial ecology", 2006.
- .Sh. Ahmadov, N. Muradov "Ecology. Atmospheric pollution" 84 p., 2008.
- N.A.Salimova, B.Sh.Shahpalengova, A. .Babayev "Engineering ecology" 634 p., 2012.
- V.T.Medvedev. "Engineering ecology." Moscow 2002.
- Nicholas P. Cheremisnoff. Handbook of Solid Waste Management and Waste Minimization Technologies Butterworth-Heinemann 2003, p465
- Vilesov N. G., Kostyukovskaya A. A. "Purification of exhaust gases." Kyiv 1971.
- T. A. Hwang. «Industrial ecology. » Rostov 2003.
- Beldeeva L.N., Lazutkina Yu.S., Komarova L.F. Environmentally safe waste management. Alt. state tech. University named after I. I. Polzunova. Barnaul: 2013. – 147 p.
- Grinin A.S., Novikov V.N. Industrial and household waste: Storage, disposal, processing. - M.: FAIR PRESS, 2002, 336 p.
- Savarin, A.A. Waste management.ract. hand; Ministry of Education of the Republic of Belarus, Gomel State. univ., 2013. – 48 p.
- Potashnikov Yu.M. Utilization of production and consumption waste. Study guide. - Tver.: TSTU Publishing House, 2004. - 107 p.
- M.B. Polozov. Study guide "Ecology of the oil and gas producing complex". - Izhevsk: Publishing house "Udmurt University", 2012. -174 p.
- Bulatov A.N. Environmental protection in the oil and gas industry. M. Nedra, 1999, 240 p.
- Gumbatov G.G. Environmental protection issues at oil and gas producing enterprises. Baku, Elm, 1999, 87 p.
- Kuznetsova T.O. Environmental safety in the oil and gas industry: study guide / T.O. Kuznetsova, E.P. Varavina. – Kh.: NTU "KhPI", 2013. – 77 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			
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	240		
Total Workload/30(h)	240/30		
ECTS Credit of the Course	7		

MODULE HANDBOOK

Ecology bachelor program, Department of "Ecology and environment".

Course Unit Title	Waste recycling
Course Unit Code	ATMF -B11
Type of Course Unit	Mandatory
Level of Course Unit	4
National Credits	
Number of ECTS Credits Allocated	7
Theoretical (hour/week)	1.5
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	7
Course Coordinator	Ulviyya Karimova-Jafarova
Name of Lecturer (s)	Ulviyya Karimova-Jafarova
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-

Course description: The main objectives of the subject "Waste-free production processes and waste recycling" are as follows:

To familiarize students with:

- industrial gaseous wastes that cause atmospheric pollution problems;
- liquid industrial wastes and by-products that reduce the technical and economic indicators of oil refining and petrochemical production
- solid industrial wastes that cause lithosphere pollution problems;
- to teach them how to choose a method for recycling industrial waste;
- development of low-waste and waste-free technologies.

Objectives of the Course: As a result of the production process, along with the production of products important for humans, a large amount of production waste is generated - in many cases, harmful waste in the form of gas, wastewater, solid residue, etc. Production waste causes the loss of valuable raw materials, valuable components of the product, and also negatively affects the quality of water and air basins.

The subject "Waste-free production processes and waste recycling" teaches scientific and technical means for solving environmental protection problems, in particular, the purpose, constructive structures and working principles of creating new - low-waste and waste-free technologies.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	<p>Processing of organic components of gas waste. Recovery units for capturing solvents from industrial and ventilation gases and returning them to the process. Some gas components are used directly in the oil refineries themselves. Dry gases, as a rule, are burned in the furnaces of the plant as technological fuels. The hydrogen-containing gas mixture obtained in the reforming processes is used in the hydrogenation (hydrocracking, hydrotreating) process. When a hydrocracking unit is included in the plant complex, the hydrogen-containing gas mixture obtained in the reforming process becomes less. In such cases, part of the dry gases is used to obtain hydrogen by the conversion method. Finally, the butane-butylene fraction produced at the plant is used as a raw material for obtaining alkyl gasoline.</p> <ul style="list-style-type: none"> - Liquid wastes obtained in oil refining and petrochemical processes and their recycling. - Liquid products formed in the pyrolysis process of hydrocarbons and ways of their efficient use. The dependence of the yield of liquid products of the pyrolysis process on the raw materials and process conditions. The yield of liquid products in the pyrolysis of gases. Characteristics of products. - Separation and processing of valuable components from the C5 fraction of the pyrolysis process. The C5 fraction of pyrocondensate is characterized by a high content of unsaturated hydrocarbons. Hydrogenation purification of the C5 fraction of pyrocondensate; directions for obtaining individual hydrocarbons (isoprene, cyclopentadiene); a stable component of gasoline; additional raw materials for pyrolysis. -Recovery of aromatic compounds from liquid products of pyrolysis. The main processing direction of liquid products of the pyrolysis process is the production of benzene, toluene, xylenes or only benzene. -Recovery of heavy pyrolysis resin. The production of petroleum polymer resins based on pyrolysis resin is widely used in industry. This is due to the availability of this raw material, relatively low operating costs, and a wide range of applications (paint, paper, tires, rubber, etc.). Obtaining petroleum polymer resins in the process of catalytic and thermal polymerization. -Wastes from alkaline cleaning of fuel and oil fractions of oil. Mylonaft, acidol, acidol-mylonaft. Esters of naphthenic acids are used as plasticizers of synthetic rubbers, PVC, etc., as well as synthetic lubricants. Naphthenic soap in alkaline waste is a mixture of sodium salts of naphthenic acids and mineral oils. It has found wide application as a detergent and cleaning component, which is used as a fat substitute in soap making, in the textile industry during dyeing, as an insecticide and fungicide, in the leather industry, in the preparation of emulsified oils, as an emulsifier of water emulsions, as physiologically active preparations in plant breeding, animal husbandry and horticulture, etc. Naphthenic soap is considered a standard industrial product - Separation of naphthenic acids from mylonaft and acidol. Methods of separation of naphthenic acids from oil (alkali, extraction, adsorption, etc.) 	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	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	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	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument making and industrial control	
5	ability to understand device manufacturing technologies, develop assembly processes, and apply mechanization and automation of processes in the production of devices and installations	
6	ability to use various types of devices to monitor and control technological processes	
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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Introduction. Waste-free production - as the basis for efficient use of nature.	
2		Gas wastes obtained in oil refining and petrochemical processes and their recycling.	
3		Components polluting the atmosphere and their characteristics. Gas waste cleaning from solid particles.	
4		Processing and utilization of industrial wastes.	
5		Cleaning of industrial waste gases from carbon monoxide and carbon dioxide. Synthesis based on carbon monoxide.	
6		Cleaning of waste gases from nitrogen oxide. Processing of industrial nitrous gas into concentrated nitric acid.	
7		Waste-free and low-emission technologies.	
8		Processing of organic components of gas wastes. Recovery devices for the capture and return of solvents from industrial and ventilation gases to the process.	
9		Liquid wastes obtained in oil refining and petrochemical processes	

		and their recycling.	
10		Liquid products formed in the pyrolysis process of hydrocarbons and ways of their efficient use.	
11		Separation and processing of valuable components from the C5 fraction of the pyrolysis process.	
12		Obtaining aromatic compounds from liquid products of pyrolysis. Processing of heavy pyrolysis tar.	
13		Wastes from alkaline cleaning of fuel and oil fractions of oil. Milonaft, acidol, acidol-milonaft.	
14		Processing and utilization of woodworking and paper-cellulose industrial waste.	
15		Utilization of wastes of chemical, metallurgical and mechanical engineering industries.	
16		Processing and utilization of agricultural, food industry waste.	
17		Processing and utilization of light, textile and plastic mass - industrial waste.	
18		Processing and utilization of solid household waste. Solid household waste landfill and their ecological significance.	
19		Collection and utilization of electronic waste.	
20		Storage and processing of radioactive waste in the nuclear fuel complex.	
21		Water contaminated with radioactive waste generated at thermal power plants and their treatment.	
22		Impact of radioactive waste on humans and the environment. Sources of radioactive waste generation and ecotoxic properties at nuclear power plants.	

Recommended Sources TEXTBOOK(S)

- J.M.Mahmudov "Technology of production areas and industrial ecology", 2006.
- Sh.Ahmadov, N.Muradov "Ecology. Atmospheric pollution" 84 p., 2008.
- N.A.Salimova, B.Sh.Shahpalengova, A. Babayev "Engineering ecology" 634 p., 2012.
- A.Novruzov "General chemical technology and industrial ecology" 384 p. 1991.
- Skachek M.A. Handling spent nuclear fuel and radioactive waste from NPPs: a textbook for universities / MPEI Publishing House, 2007, 448 p.
- Vetoshkin A.G. Equipment and technology for handling waste from vital activity: A textbook in 2 parts, Part 2. Processing and disposal of industrial waste / M.-Infra-Engineering, 2019, 380 p.
- Lotosh V.E. Processing of waste from nature management. Yekaterinburg: Polirafist, 2007, 503 p.
- Nikulichev Yu.V. Waste management. The experience of the European Union. Analytical review / RAS. INION. Center for Scientific and Information Research of Global and Regional Problems. Dep. of European Security Problems. – M., 2017. – 55 p. – (Series: Social and economic problems of globalization).
- M.B. Polozov. Study guide "Ecology of the oil and gas producing complex". – Izhevsk: Publishing house "Udmurt University", 2012. -174 p.
- Bulatov A.N. Environmental protection in the oil and gas producing industry. M. Nedra, 1999, 240 p.
- Gumbatov G.G. Environmental protection issues at oil and gas producing enterprises. Baku, Elm, 1999,87 p.
- Kuznetsova T.O. Environmental safety in the oil and gas industry: study guide / T.O. Kuznetsova, E.P. Varavina. – Kh.: NTU "KhPI", 2013. – 77 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			
<ul style="list-style-type: none"> • 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			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			7

MODULE HANDBOOK

Ecology bachelor program, Department of “Ecology and environment”.

Course Unit Title	Environmental assessment of waste
Course Unit Code	ATMF-B11
Type of Course Unit	Mandatory
Level of Course Unit	
National Credits	7
Number of ECTS Credits Allocated	
Theoretical (hour/week)	1.5
Practice (hour/week)	1
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Ulviyya Karimova-Jafarova
Name of Lecturer (s)	Ulviyya Karimova-Jafarova

Name of Assistant (s)		-
Mode of Delivery		Face to face
Language of Instruction		Azerbaijani
Prerequisites		-
Recommended Optional Program Components		-
<p>Course description: The main goals and objectives of studying the subject are as follows: To study and master the theoretical material of the course in the form of lectures and independent work; -To form the ability to independently solve the problems and tasks specified in the program - during practical exercises and independent audience; To evaluate the proposed activities to determine the types, nature and estimated volumes of waste to be formed; To identify any potential impacts on the environment as a result of waste generation at the site; To recommend appropriate measures/routes for waste treatment and disposal in accordance with existing legislative and administrative requirements; To classify waste materials.</p>		
<p>Objectives of the Course: This course examines current policies and practices related to the environmental assessment of waste and resources and re-evaluates the need for better waste management systems in society. Increasing resource scarcity and environmental pressures are key factors in moving towards better waste management systems and technologies that will help society limit its impacts on the Earth.</p>		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	A wide range of teaching and learning methods are used in the teaching process of this subject, such as lectures, interactive discussions, team projects, work in small groups, business games, study and analysis of special examples (case studies), writing essays or independent work, and completing test tasks. In addition, special attention will be paid to the analysis, discussion, and logical conclusions of articles, real examples, and special cases taken from foreign and local technical literature, as well as international and local media (internet resources). In order to form the skills of applying the knowledge gained, students will solve tasks selected according to the topic. Before teaching each new topic, students should familiarize themselves with the specified texts and other reading materials presented (assigned) to them.	
Assessment Methods: 1. Final Exam, 2. Presentation 3. Midterm 4. Quiz		
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	
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	and industrial control	
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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	
8	ability to use modern information technologies and software, observing information security requirements in their professional activities	
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	
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	

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

Course Contents

Week	Chapter	Topics	Exam
1		Basic concepts of the subject of ecological assessment of waste. Objectives and tasks of the subject.	
2		Classification principles of waste management in the world according to "General Laws and Regulations".	
3		Laws of the Republic of Azerbaijan on industrial and domestic waste.	
4		Waste processing methods. Application and concept of waste recycling.	
5		Waste assessment, management, reduction through the application of modern technology.	
6		Utilization technologies and physico-chemical methods of waste treatment and utilization.	
7		Solid waste and ways of its recovery. Problems caused by solid waste and their recycling.	
8		Utilization and processing of industrial and domestic waste. Ecological assessment of domestic waste.	
9		Ecological assessment and recycling of industrial waste.	
10		Organization of a solid waste collection system.	
11		Technological processes used during waste processing. Mechanical and thermal processing of solid waste.	
12		Biological processing of waste and energy recovery systems.	
13		Biological basis of the process of composting the organic fraction of waste. Industrial technologies of composting and application of composts.	
14		General principles of waste incineration and energy recovery	
15		Waste disposal.	

Recommended Sources
TEXTBOOK(S)

- A.Novruzov "General chemical technology and industrial ecology" 384 p. 1991.
- J.M.Mahmudov "Technology of production areas and industrial ecology", 2006.
- N.A.Salimova, B.Sh.Shahpalengova, A. .Babayev "Engineering ecology" 634 p., 2012.
- Azizov A.M. "Waste treatment systems". Baku. "Education" NPM, 2015, 234 p.
- Diaz L.F., Savage G.M., Eggert L.L. and Golueke. 2003, Solid waste management for economically developing countries, 2nd edition. Concord, California: Caloris Recovery.
- Kiely G., 1997, Environmental engineering, McGraw-Hill, England.
- Mihelsik J.R. and Zimmerman J.B., 2010, Environmental Engineering, John Wiley & Sons, Inc.
- Txobanoglus G.H., Teyzen H., Vigil S.A. 1993, Integrated Solid Waste Management. New York: McGraw-Hill.
- Kukin PP, Popov VM, Yushin VV Equipment and technology protect the environment. Textbook for universities. Publishing house: Higher school, 2005, 391 p.
- Kolesnikov SI Basics of ecology for engineers. Textbook. Published by: Phoenix, Higher Education Series, 2003, 352 p.
- Krivoshein DA, Kukin PP, Lapin VL Engineering protection of surface water from industrial stockpiles. Textbook for university students. Publishing house: Higher school, 2003, 344 p.
- Khoruzhaya TA Environmental risk assessment: safety, risk assessment methods, monitoring. Publishing house: Service book, 2002, 208 p.
- Panin VF, Sechin AI, Fedosova VD Ecology for engineers. Textbook (edited by Panina VF) Publishing house: Noosphere, 2001, 284 p.
- Mazur II, Moldaenov OI Engineering ecology course. Textbook for universities (ed. Mazura II). Publishing house: Higher school, 2001, 447 p.
- Platonov AP, Platonov VA Basics of general and engineering ecology. Publishing house: Phoenix, series "Textbooks, textbooks", 2002, 352 p.
- Kuznetsova T.O. Environmental Safety in the Oil and Gas Industry: a textbook / T.O. Kuznetsova, E.P. Varavina. - Kh.: NTU "KhPI", 2013. - 77 p.
- Applied Ecology: a textbook for students of higher educational institutions studying in environmental specialties /T.A.Trifonova, N.V.Selivanova, N.V. Mishchenko, 3rd ed., Moscow: Acad. Project: Gaudeamus, 2007 .381 p.
- Selivanovskaya S.Yu. Production and consumption waste: legal regulation, disposal, placement: textbook. Kazan: Kazan. state University, 2009.-222 p.
- Technology of solid municipal waste: Textbook / L.Ya. Shubov, M.E. Stavrovsky, A.V.Oleynik; NP "Unikom Service". - M.: Alfa-M: INFRA-M, 2011. - 400 p.
- <http://znanium.com/bookread.php?book=2291686>.
- Waste Technology: Textbook / L.Ya. Shubov, M.E. Stavrovsky, A.V. Oleynik. - M.: Alfa-M: INFRA-M, 2011. - 352 p.
- Waste Management: Textbook / B.B. Bobovich. - M.: Forum: NIC INFRA-M, 2013. -88 p.

Assessment

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Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
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Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class			
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Self-study			
Tutorials			
Midterm Examination			
Preparation for midterm exam			
Final Examination			
Preparation for final exam			
Total Workload			240
Total Workload/30(h)			240/30
ECTS Credit of the Course			7