MODULE HANDBOOK

Ms program in Methods of Environmental Protection and Restoration

MODULE HANDBOOK

Methods of Environmental Protection and Restoration master program, Department of "Ecology and Environment".

Course Unit Title	Modern problems of ecology
Course Unit Code	
Type of Course Unit	Mandatory
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	
Practice (hour/week)	
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Phd. Leyla Cavadova
Name of Lecturer (s)	Phd. Leyla Cavadova
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-

Objectives of the Course:

General ecology studies the mutual relations between living organisms and the environment surrounding them. The main task of general ecology is to study the interaction of organisms with each other and the population-biocenotic level with the environment, the biological life of macrosystems at a high level:

Living environment and ecological factors. Ecological laws, principles and rules. Population. Classification. Age structure of populations in plants. Biological, sexual structures. Types of distribution of the territory. Ethological structure of animal populations. Dynamics of populations. Biocenoses. Structure of biocenoses. Territorial-spatial structure. Relationships of organisms in the biocenoses. Trophic, topical, phoric, fabrication relationships. Ecological systems. As a basis for the study of general ecology, modern-level systems - bio and geosystems and their dynamics, time and space, as well as the influence of internal and external factors are studied. Biosphere. Distribution of life in the biosphere, main functions, cycles. The basics of general ecology consider both theoretical and applied aspects. Here, the main attention is paid to natural systems of various levels. Ecological problems of the Republic of Azerbaijan. Main sources of pollution of the natural environment in Azerbaijan. Ecological situation of efficient use of the resources of the Republic of Azerbaijan. Regional and international cooperation in environmental protection and its importance. Pollution of the Araz and Kura rivers and their protection. Ecological problems of the Caspian Sea. General characteristics of the Caspian Sea.

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

1	- - Forming ideas about the goals and tasks of ecological science, scientific-research methods, and its connection with other sciences;	
2	- - Forming ideas about environmental factors;	
3	- - Formation of ideas about ecological teaching tools;	
4	- - Formation of ideas about pedagogical principles and teaching methods;	
5	- - Forming students' ideas about the goals and tasks of their training;	
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, aims, and objectives of the course	
2.		Global problems of the modern era and globalization	
3.		Global ecological crises	
4.		Ecological consequences of global climate change	
5.		Ecology in the context of war and peace issues	

6.		Problem of radioactive contamination and its forecasting	
7.		Urbanization and demographic processes as global problems	
8.		Ecological consequences of demographic problems	
9.		Anthropogenic impacts on the lithosphere and their ecological consequences	
10.		Food and raw material problems and their solutions	
11.		Energy-related environmental problems in ecology	
12.		Ecological consequences of hydrosphere pollution and depletion of surface and groundwater resources	
13.		Sustainable use of world ocean resources	
14.		Global atmospheric pollution and the modern ozone problem	
15.		The problem of peaceful exploration of outer space	

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

- 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			
Total Workload/45(h)			
ECTS Credit of the Course			

MODULE HANDBOOK

Methods of Environmental Protection and Restoration master program, Department of "Ecology and Environment".

Course Unit Title	Organization of ecological business.
Course Unit Code	
Type of Course Unit	Mandatory
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	
Practice (hour/week)	
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Prof. Aydin Yahyayev
Name of Lecturer (s)	Prof. Aydin Yahyayev
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-

The subject teaches materials on the organization and feasibility of ecological business in all areas related to the environment in the Republic of Azerbaijan, as well as on legislative acts in this field and practices applied locally.

Objectives of the Course:

The main goal of teaching the subject is to teach undergraduates the possibilities of using ecosystems in the environment, the characteristics of creating and implementing business activities in these areas, and the legislative acts and regulations in this direction.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	- Study of the characteristics of the formation of ecosystems in the Republic, their use practices;	
2	- Study of the types of products and materials considered ecologically clean in the Republic;	
3	- Study of the main areas of ecotourism in the Republic, their development prospects;	
4	- Study of the characteristics of the organization of ecotourism in the forest fund of the Republic;	

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		Forms of environmental activities and their licensing.	
2		Licensing of natural resources and rules for their use.	
3		Rules for the use of forests on a contractual basis.	
4		Rules for the release of pollutants into the atmosphere and their control.	
5		State environmental expertise at the national and regional levels.	
6		Ecological business: ideas and projects.	
7		Demand and production of electricity.	
8		Production and use of eco-products	
9		Creation and development of eco-tourism	
10		Production and use of ecological materials.	
11		State registration of eco-activity.	
12		Features of taxation in ecological activity.	
13		Ecological collection.	
14		Features of business planning in the field of eco-business.	
15		Drawing up the structure of a business plan for obtaining resident status.	

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

- 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			
Total Workload/45(h)			
ECTS Credit of the Course			

Methods of Environmental Protection and Restoration master program, Department of "Ecology and Environment".

Course Unit Title	Processing of wastes discharged into the environment.
Course Unit Code	
Type of Course Unit	Mandatory
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	
Practice (hour/week)	
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	-

The main objective of the course is that the problem of safe waste management is currently one of the most pressing environmental problems in the world. During the teaching of the subject, undergraduates will be taught lectures and seminars/workshops on the impact of waste on the environment and human health, waste classification, basic principles and rules of waste management, permits and licenses, standards and norms, technological equipment and devices used in the processing/neutralization of waste in various sectors of industry, and international and local experience in the field of waste management.

Objectives of the Course:

The purpose of the subject is to train qualified specialists-ecologists in the field of environmental protection, to form the ability to take a systematic approach to waste management. One of the main directions of teaching the subject is to educate civic responsibility in the field of protecting the natural environment in the Republic of Azerbaijan.

Learning Outcomes

At the end of the course the student will be able to		Assessment
1	- will have professional education in the chosen field of activity in the direction of waste management;	
2	- will have knowledge and skills in the fields of operation of modern technologies and equipment for waste management, protection of people and the environment from technogenic and anthropogenic impacts of waste;	
3	- will have knowledge and skills in the field of assessment and reduction of the negative impacts of waste on human health and the environment during the expert assessment of production activities and projects and conducting monitoring to ensure environmental safety.	
4	- Formation of ideas about the goals and objectives of their training in students;	

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. General concepts.	
2		Assessment of the environmental impact of waste.	
3		Classification of waste.	
4		Permits and licenses in the field of waste management.	
5		Waste treatment and neutralization.	
6		Waste recycling.	
7		Treatment and neutralization of waste generated during wastewater treatment.	
8		Management of solid household waste (SWW).	
9		Treatment/neutralization of waste containing oil and oil products.	
10		Management of chemical industry waste.	
11		Treatment and neutralization of waste generated in the galvanic process.	
12		Neutralization of used oils and tires.	
13		Treatment and neutralization of waste generated in agriculture.	
14		Treatment and neutralization of industrial waste discharged into the atmosphere.	
15		Experience in waste management in EU countries.	
16		The concept of waste.	
17		Permits and licenses in the field of waste management.	
18		Waste generated in agriculture.	
19		Waste treatment during wastewater treatment.	
20		Waste treatment containing oil and oil products.	
21		Treatment of industrial waste discharged into the atmosphere	
22		Solid household waste treatment	
23		Waste management practices in EU countries.	

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 • 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			
Total Workload/45(h)			
ECTS Credit of the Course			

Methods of Environmental Protection and Restoration master program, Department of "Ecology and Environment".

Course Unit Title	Ecological problems of efficient use of natural resources.
Course Unit Code	MİF-B04.02
Type of Course Unit	Mandatory
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	
Practice (hour/week)	
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	Phd. Aruz Mikayilov
Name of Lecturer (s)	Phd. Aruz Mikayilov
Name of Assistant (s)	-
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-
All elements of nature and components of the environment that are used and can be used for human survival and the development of productive forces in society are included in the concept of natural	

resources. People have been using natural resources since ancient times, and this is reflected in the names of historical periods such as the "Stone Age", "Bronze Age", "Iron Age". Today, more than 200 types of natural resources are used on our planet. Resources differ from each other in a number of indicators. The use of natural resources (reserves), the organization of their efficient use, and ensuring increased protection are based on their classification.		
- Proper placement of production areas on the ground. - Determining the appropriate use of natural resources, depending on their properties. - Efficient organization of joint use of production areas. - Creating a healthy environment for people and organisms useful to them.		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	To create an idea about natural resources, their efficient use and protection problems.	
2	To create a basic understanding of nature protection, to show the characteristics of nature protection problems.	
3	To introduce the main ecological problems of the modern era, to show the main manifestations of the global and ecological crisis.	
4	To create an idea about environmental protection on a scientific basis.	
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 objectives of the subject “Ecological problems of efficient use of natural resources”.	
2		On the ecological foundations of nature use. Modern ideas about the using of nature.	
3		Basic concepts of natural resource use.	
4		Ecological and economic needs and interests. Social and ecological problems of natural resource use.	
5		Main directions of environmental policy.	
6		Assessment of environmental damage in the use of the environment and nature.	
7		The necessity of economic assessment of natural resources.	
8		Main directions of nature use in the Republic of Azerbaijan.	
9		Problems of using alternative energy resources.	
10		Assessment of pollution of the atmosphere, water bodies and soil.	
11		Anthropogenic impact and environmental pollution.	
12		Ecological foundations of efficient use of natural resources.	
13		Forecasting and planning of nature use.	
14		Efficiency indicators of nature use and the environment.	
15		Economic stimulation in the field of efficient use of natural resources and environmental protection.	

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

- 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			
Total Workload/45(h)			
ECTS Credit of the Course			

MODULE HANDBOOK

Methods of Environmental Protection and Restoration master program, Department of "Ecology and Environment".

Course Unit Title	**Academic Writing and Ethics**
Course Unit Code	
Type of Course Unit	Mandatory
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	
Practice (hour/week)	
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	
Name of Lecturer (s)	fil.ü.f.d. Huseynova Ulker Elmar
Name of Assistant (s)	fil.ü.f.d. Huseynova Ulker Elmar
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-

Objectives of the Course:

The aim of teaching the course "Academic Writing and Ethics" is to introduce students to the methods of acquiring scientific writing skills and to emphasize the importance of adhering to academic writing conventions and ethical principles.

During the teaching process, the characteristics of scientific style and academic language norms are explained. The structural organization and content planning of academic texts are taught. Students are trained in working with scientific sources and information retrieval skills. Citation and referencing techniques are taught in accordance with international standards. The concept of plagiarism and the problems it creates in the academic environment are explained.

Ethical conduct in scientific writing is discussed in detail. The characteristics of different types of academic texts are also introduced.		
At the end of the course the student will be able to		Assessment
1	- To correctly structure scientific texts (introduction, main body, conclusion); - To acquire skills in topic selection and formulation of scientific problems; - To search for, select, and evaluate academic sources;	
2	- To use scientific sources accurately and purposefully;	
3	- To apply international citation and referencing rules;	
4	- To demonstrate skills in editing and improving written works;	
5	- To apply critical and analytical thinking skills in academic writing.	
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.		General information about the course "Academic Writing and Ethics"	
2.		Research methods	
3.		Argumentation and critical thinking in academic writing	
4.		Models of academic writing	
5.		The impact of artificial intelligence technologies on academic writing and ethical challenges	
6.		General concepts and ethical principles in the preparation of research work	
7.		Main genres of academic writing	
8.		Rules for writing scientific articles	
9.		Methods of using sources and references in academic writing	
10.		Publication principles and ethics in international and local scientific journals	
11.		Requirements for the preparation of dissertations	
12.		Main content of a master's dissertation	
13.		Abstract of a master's dissertation	
14.		Evaluation process of scientific works	
15.		Ethical values in academic writing. Plagiarism and its prevention	

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

- 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			
Total Workload/45(h)			
ECTS Credit of the Course			

MODULE HANDBOOK

Methods of Environmental Protection and Restoration master program, Department of "Ecology and Environment".

Course Unit Title	**"Mathematical analysis of agroecological research"**
Course Unit Code	
Type of Course Unit	Mandatory
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	
Practice (hour/week)	
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	
Name of Lecturer (s)	Ramiz Gulamov
Name of Assistant (s)	Ramiz Gulamov
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-
Objectives of the Course: This course focuses on the application of mathematical and statistical methods in agroecological research. It covers the collection, processing, analysis, and interpretation of agroecological data, as	

well as the use of modern analytical approaches for evaluating environmental and agricultural processes. The course also introduces students to experimental design, modeling techniques, data visualization, and the assessment of ecological indicators in agricultural systems. Special attention is given to the practical application of mathematical tools for solving agroecological problems and supporting sustainable agricultural development.

- To provide students with fundamental knowledge of mathematical and statistical methods used in agroecological research;
- To develop skills in data collection, processing, and quantitative analysis;
- To teach methods of modeling and forecasting agroecological processes;
- To enhance students' ability to interpret research results scientifically;
- To apply analytical methods for evaluating environmental and agricultural systems;
- To develop critical and analytical thinking skills in scientific research;
- To support the application of sustainable and evidence-based approaches in agroecology.

At the end of the course the student will be able to		Assessment
1	apply mathematical and statistical methods in agroecological research;	
2	collect, process, and analyze agroecological data effectively;	
3	interpret and evaluate research findings using scientific approaches; design and conduct agroecological experiments;	
4	use modeling techniques to assess and forecast environmental and agricultural processes; apply analytical tools for solving agroecological problems;	
5	prepare and present scientific reports based on research results; demonstrate critical and analytical thinking in agroecological studies.	

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
16.		Importance of Agroecological Studies.	
17.		Principles and Methodologies of Agroecological Studies.	
18.		Agricultural Surveys and Environmental Monitoring.	
19.		Sampling Methods in Agroecological Studies.	
20.		Introduction to Statistics and Biostatistics.	
21.		Data Presentation and Descriptive Statistics.	
22.		Probability Theory and Its Application.	
23.		Population and Sampling.	
24.		Statistical Inference.	
25.		Correlation Analysis.	
26.		Regression Analysis.	
27.		Analysis of Variance (ANOVA).	
28.		Experimental Design in Agroecological Research.	
29.		Factorial Experiments.	
30.		Advanced Experimental Design	

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 • 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			
Total Workload/45(h)			
ECTS Credit of the Course			

MODULE HANDBOOK

Methods of Environmental Protection and Restoration master program, Department of "Ecology and Environment".

Course Unit Title	**Agroclimatic resources and agriculture**
Course Unit Code	
Type of Course Unit	Mandatory
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	
Practice (hour/week)	
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	

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

Objectives of the Course:

This course provides students with fundamental knowledge about the nature of agroclimatic resources, as well as their role and significance in agriculture. Within the framework of the course, the impacts of climatic factors (temperature, precipitation, solar radiation, humidity, etc.) on crop production and animal husbandry are studied. At the same time, issues related to the rational use of agroclimatic resources for the sustainable development of agriculture and the assessment of the impacts of climate change are also analyzed.

The course also covers topics such as the planning of agricultural production in different climatic zones, approaches to increasing productivity, and the application of modern agroclimatic models.

At the end of the course the student will be able to		Assessment
1	• Is able to explain the content of agroclimatic resources and their role in the agricultural sector;	
2	• Is able to assess the impact of key climatic factors (temperature, precipitation, humidity, solar radiation, etc.) on agricultural productivity; • Is able to analyze the characteristics of different agroclimatic zones and plan appropriate agricultural activities in those zones;	
3	• Is able to identify the impacts of climate change on agriculture and propose appropriate adaptation measures;	
4	• Is able to make decisions to optimize crop production using agroclimatic data;	
5	• Is able to analyze agroclimatic models and technologies and evaluate their potential applications.	

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
		Subject, objectives, and key concepts of agroclimatology	
		Functional role of soil in ecosystems and its significance in agriculture	
		The role and importance of agroclimatology and agrometeorological factors in agriculture	
		Solar radiation and its role in agriculture	
		Soil temperature regime and its role in crop production	
		Atmospheric precipitation and its role in agriculture	
		Weather, its variability and forecasting, and its role in agriculture	
		Agriculture and adverse meteorological phenomena	
		Climate and climate-forming factors; assessment of agroclimatic resources and agricultural productivity of a region	
		Agroclimatic zoning of a region and agrometeorological forecasting	
		Agroclimatic zoning of the world and continents	
		Climatic conditions of Azerbaijan and their role in agriculture	
		Agroclimatic zoning of Azerbaijan	
		Climate change and risk management in agriculture	
		Modern research methods in agrometeorology and their practical applications	

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

- 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			
Total Workload/45(h)			
ECTS Credit of the Course			

MODULE HANDBOOK

Methods of Environmental Protection and Restoration master program, Department of "Ecology and Environment".

Course Unit Title	**Agrochemistry and Environmental Protection**
Course Unit Code	
Type of Course Unit	Mandatory
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	
Practice (hour/week)	
Laboratory (hour/week)	

Year of Study	
Semester when the course unit is delivered	
Course Coordinator	
Name of Lecturer (s)	Phd. Leyla Cavadova
Name of Assistant (s)	Phd. Leyla Cavadova
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-

Objectives of the Course:

The course primarily provides extensive information on agrochemistry and environmental protection, offering students scientific and theoretical knowledge aimed at identifying and addressing ecological problems arising in agriculture, as well as preserving soil fertility.
The main objective of teaching this course is to provide comprehensive knowledge about soil and its role in agroecosystems, which is of great importance for agriculture and environmental health. It aims to cover mineral fertilizers and pesticides used in preserving soil fertility and increasing crop productivity, as well as to educate students on alternative farming systems, environmental problems arising from the use of fertilizers and pesticides, and integrated pest management measures.

At the end of the course the student will be able to		Assessment
1	• To teach students the main environmental problems arising from agricultural activities and ways to mitigate them, and to orient them toward modern scientific 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
		Topic No. 1. Subject and methodology of agrochemistry. Concept of agroecosystems	
		Topic No. 2. Agroecosystems under technogenic conditions	
		Topic No. 3. Ecological characteristics of soil cadastre in Azerbaijan	
		Topic No. 4. Environmental problems of chemicalization in Azerbaijan	
		Topic No. 5. Environmental problems of mechanization in Azerbaijan	
		Topic No. 6. Irrigation issues in agriculture. Characteristics of crop cultivation under irrigation conditions. Environmental problems and significance of irrigation	
		Topic No. 7. Environmental problems of the livestock sector in Azerbaijan	
		Topic No. 8. Soil–biotic complex (SBC) as the basis of agroecosystems	
		Topic No. 9. Biogenic pollution of water in the intensification of agro-industry	
		Topic No. 10. Alternative farming systems and their agroecological significance	
		Topic No. 11. Vermiculture and biohumus: preparation and environmental aspects of their use	
		Topic No. 12. Sustainability of agricultural ecosystems	
		Topic No. 13. Problems related to various living organisms and ways of their conservation	
		Topic No. 14. Anthropogenic climate change and its impact on agricultural production in Azerbaijan	
		Topic No. 15. Agroecological monitoring	

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

- 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			
Total Workload/45(h)			
ECTS Credit of the Course			

MODULE HANDBOOK

Methods of Environmental Protection and Restoration master program, Department of "Ecology and Environment".

Course Unit Title	**Ecology and Regulation of the Atmosphere**
Course Unit Code	
Type of Course Unit	Mandatory
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	
Practice (hour/week)	

Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	
Name of Lecturer (s)	Phd. Aruz Mikayilov
Name of Assistant (s)	Phd. Aruz Mikayilov
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-

Objectives of the Course:

To achieve the objectives set during the teaching of the course, the following tasks are intended to be addressed:

- To investigate the current state of the atmospheric pollution problem;
- To study the composition of atmospheric gases, as well as their physical and chemical transformations;
- To analyze the processes occurring in different layers of the atmosphere;
- To examine the negative impacts of black and non-ferrous metallurgy, as well as oil and gas industry enterprises on the atmosphere, and to develop measures for reducing these impacts;
- To improve the operation of purification systems in order to minimize the negative environmental effects of exhaust gases generated by agricultural enterprises.

At the end of the course the student will be able to		Assessment
1	• Major sources of air pollution in cities;	
2	• Average annual atmospheric pollution;	
3	• Emissions released into the atmosphere from industrial production, metallurgy, chemical, oil and gas, and coal industries;	
4	• Emissions released into the atmosphere from thermal power plants operating on gas, coal, and fuel oil;	
5	• High levels of air pollution in large cities;	
6	• The severity of the overall environmental situation;	
7	• Developing knowledge about the formation of the “greenhouse effect”.	

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
		Layers of the atmosphere and characteristics of its chemical composition	
		Natural sources of atmospheric pollution	
		Anthropogenic impacts on the atmosphere	
		The role of the mining industry in atmospheric pollution	
		The role of the oil and gas industry in atmospheric pollution	
		Renewable energy sources: the importance of solar and wind energy	
		Atmospheric pollution by radioactive substances and its consequences	
		Ecological problems caused by electromagnetic radiation	
		Environmental damage caused by transport vehicles to the atmosphere	
		Greenhouse gases and their role in global climate change	
		The ecological role and protection of the ozone layer	
		Causes of acid rain formation and its environmental impacts	
		Photochemical pollution of the atmosphere and its ecological consequences	
		Atmospheric monitoring and environmental standards	
		State policy and legislation of the Republic of Azerbaijan on atmospheric air protection	

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

- 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			
Total Workload/45(h)			
ECTS Credit of the Course			

MODULE HANDBOOK

Methods of Environmental Protection and Restoration master program, Department of "Ecology and Environment".

Course Unit Title	**Production challenges of ecologically adapted agricultural products**
Course Unit Code	
Type of Course Unit	Mandatory
Level of Course Unit	

National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	
Practice (hour/week)	
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	
Name of Lecturer (s)	Ulkar Gadiyeva
Name of Assistant (s)	Ulkar Gadiyeva
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-

Objectives of the Course:

The main objective of the course is to provide master's students with theoretical and practical foundations of environmentally safe and sustainable agricultural production, and to develop knowledge and skills in soil and water resource conservation, reduction of environmental risks, and the production of high-quality, environmentally friendly agricultural products. The course also aims to develop students' scientific research and analytical thinking skills in areas such as agroecosystem management, the impact of climate change on agriculture, organic production technologies, and resource-conserving approaches.

At the end of the course the student will be able to		Assessment
1	• Explains the theoretical foundations of ecologically adapted agriculture;	
2	• Analyzes the ecological characteristics of agroecosystems;	
3	• Evaluates methods for the conservation of soil and water resources;	
4	• Identifies problems of soil pollution, erosion, and salinization;	
5	• Analyzes the environmental impact of pesticides and fertilizers;	
6	• Applies the principles of organic agriculture and environmentally friendly food production;	
7	• Assesses the impact of climate change on agriculture.	

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
		Theoretical foundations, concept, and sustainable development principles of ecological agriculture	
		Current problems and prospects of ecologically adapted agriculture	
		Ecological assessment of soil resources	
		Efficient use of water resources in agriculture	
		Environmentally safe fertilization systems	
		Environmental problems associated with pesticide use	
		Application of ecological innovative technologies in agriculture	
		Impacts of climate change on agriculture	
		Processing and utilization of agricultural and food industry waste	
		Agroecological monitoring and assessment	
		Application of GIS and digital technologies in the agricultural sector	
		Production of environmentally friendly crop products and environmental safety issues in animal husbandry	
		Problems of ecological agriculture in Azerbaijan	
		Ecological certification and quality control	
		Economic efficiency of ecologically adapted agriculture	

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

- 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			
Total Workload/45(h)			
ECTS Credit of the Course			

MODULE HANDBOOK

Methods of Environmental Protection and Restoration master program, Department of "Ecology and Environment".

Course Unit Title	**Environmental problems arising from the development of agriculture**
Course Unit Code	
Type of Course Unit	Mandatory
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6

Theoretical (hour/week)	
Practice (hour/week)	
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	
Name of Lecturer (s)	Phd. Aruz Mikayilov
Name of Assistant (s)	Phd. Aruz Mikayilov
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-

Objectives of the Course:

The main objective of teaching this course is to provide students with knowledge about the history of agricultural development, the role of soil in agroecosystems, alternative farming systems, mineral fertilizers and pesticides used in agriculture, environmental problems arising from the use of fertilizers and pesticides, the ecological significance of irrigation, and integrated pest management measures.

At the end of the course the student will be able to		Assessment
1	• To develop students' understanding of the aims and objectives of the course and its relationship with other disciplines;	
2	• To develop students' understanding of teaching and learning resources;	
3	• To teach students the main problems arising from the development of agriculture and to orient them toward modern scientific knowledge in this field;	
4	• Familiarization with farming systems;	
	•	
	•	
	•	

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
		History of agricultural development. Farming systems	
		Functional role and importance of soil in ecosystems	
		Chemical composition of soil. Nutrients and their role in plant nutrition	
		Soil degradation and its mitigation	
		Concept of agroecosystems. Types, structure, and functions of agroecosystems	
		Mineral fertilizers used in agriculture	
		Environmental problems associated with the use of mineral fertilizers	
		Irrigation issues in agriculture. Characteristics of crop cultivation under irrigation conditions	
		Ecological problems and significance of irrigation. Pollution of irrigation water under intensive agriculture	
		Use of pesticides in agriculture. Pest control measures and related environmental problems	
		Environmental problems arising from the development of agriculture	
		Ecological problems of saline and sodic soils	
		Vermiculture, production and application of biohumus, and their environmental aspects	
		Impact of agrometeorological conditions on agriculture	
		Anthropogenic soil pollution	

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

- 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			
Total Workload/45(h)			
ECTS Credit of the Course			

MODULE HANDBOOK

Methods of Environmental Protection and Restoration master program, Department of "Ecology and Environment".

Course Unit Title	**Livestock development and environmental problems**
Course Unit Code	
Type of Course Unit	Mandatory
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	

Practice (hour/week)	
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	
Name of Lecturer (s)	Phd. Ramil Sadigov
Name of Assistant (s)	Phd. Ramil Sadigov
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-

Objectives of the Course:

Informatics, environmental studies, and land management training—as well as other environmentally related specialties—focus on understanding the high importance of the agricultural sector, particularly the agro-industrial complex, within the national economy and on exploring ways to ensure its compliance with environmental requirements. During the semester, the course "Livestock Development and Environmental Problems" covers its objectives, essence, place in the system of agricultural sciences, and its interrelations with other disciplines. It also includes the classification of natural resources and the study of cadastres of soils, forests, water resources, cities, landscapes, mineral resources, agro-industrial sectors, and other fields.

At the same time, students will acquire knowledge of ecological assessment of soils. The course also examines how livestock development and environmental problems relate to other environmentally oriented specialties, focusing on methods to ensure that soils are properly valued within agriculture and the agro-industrial complex in accordance with environmental requirements.

At the end of the course the student will be able to		Assessment
1	• To develop students' understanding of the aims and objectives of the course "Livestock Development and Environmental Problems," its research methods, and its interrelations with other disciplines;	
2	• To develop students' understanding of livestock development and environmental problems in various sectors;	
3	• To form students' understanding of teaching and learning resources related to livestock development and environmental problems;	
4	• To develop students' understanding of pedagogical principles and teaching methods;	
5	• To form students' understanding of the aims and objectives of the learning process;	
6	• To develop students' understanding of the course content of "Livestock Development and Environmental Problems."	
7	•	

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
		Topic 1. Essence and subject of the course “Livestock Development and Environmental Problems”	
		Topic 2. Law of the Republic of Azerbaijan on peasant (farmer) farms	
		Topic 3. Law of the Republic of Azerbaijan on peasant (farmer) farms	
		Topic 4. Natural resource potential of agricultural production and the food problem. Agro-technical services play a key role in increasing agricultural productivity. It is known from agroecology that environmentally compliant agricultural products, especially perennial and annual plants used as food, are preferably fertilized with organic fertilizers.	
		Topic 5. Agricultural ecosystems (agrosystems). In agriculture, the selection of soil and sowing materials depending on natural conditions is of great importance. Agricultural measures should be implemented in accordance with high agro-technical standards depending on soil and climate conditions.	
		Topic 6. Livestock complexes and nature protection: pasture areas and their use. Livestock complexes are considered one of the main	

		sectors of agriculture. Therefore, pasture areas should be used efficiently while ensuring environmental protection and crop protection. Proper standards in pasture management help reduce anthropogenic impacts and improve the feed base.	
		Topic 7. Livestock and cattle breeding in Azerbaijan. Comprehensive information on the two main sectors of agriculture—crop production and animal husbandry in Azerbaijan—and meeting population demand for meat, milk, and egg products.	
		Topic 8. Agriculture and agro-industrial complexes of Azerbaijan. Crop production.	
		Topic 9. Analysis of livestock development and environmental problems by economic regions of Azerbaijan.	
		Topic 10. Livestock development and environmental problems in the Absheron and Aran economic regions.	
		Topic 11. Livestock development and environmental problems in the Ganja-Gazakh, Sheki-Zagatala, and Mountainous Shirvan economic regions.	
		Topic 12. Livestock development and environmental problems in other economic regions.	
		Topic 13. Approval of development programs for livestock development and environmental problems in economically affected regions, including those damaged during occupation and to be restored after liberation, and analysis of future infrastructure provision.	
		Topic 14. Environmental problems of mechanization in livestock development and agro-technical mechanical services. Agricultural land preparation in the agricultural sector is carried out depending on relief and natural conditions. Ploughing, canal construction, and other agro-technical operations must be adapted to terrain and environmental conditions, with special attention to the use of machinery.	
		Topic 15. Monitoring in livestock development: methodological and organizational foundations. Farm monitoring is carried out regularly to identify changes in natural conditions and soil, to control annual productivity, and to provide guidance for achieving higher future yields.	

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

- 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			
Total Workload/45(h)			
ECTS Credit of the Course			

MODULE HANDBOOK

Methods of Environmental Protection and Restoration master program, Department of "Ecology and Environment".

Course Unit Title	**Territorial organization of livestock farming and environmental protection**
Course Unit Code	
Type of Course Unit	Mandatory
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	
Practice (hour/week)	
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	
Name of Lecturer (s)	Phd. Aruz Mikayilov
Name of Assistant (s)	Phd. Aruz Mikayilov
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani

Prerequisites	-
Recommended Optional Program Components	-

Objectives of the Course:

The course “Territorial Organization of Livestock Farming and Environmental Protection” focuses on the principles of proper design and spatial planning of livestock farms in order to maintain ecological balance and increase agricultural productivity. It provides students with knowledge on the environmentally appropriate siting of livestock facilities, efficient use of land and water resources, and the conservation of biodiversity.

At the same time, modern approaches to the management of animal waste, prevention of pollution, and reduction of impacts such as odor and noise are examined. Students learn to assess the impact of livestock activities on ecosystems and to plan engineering and organizational measures for environmental protection.

The course integrates both theoretical foundations and practical approaches, fostering professional competence and environmental responsibility in students. During the learning process, relevant regulatory and legal documents, environmental standards, and sustainable development concepts are also analyzed.

At the end of the course the student will be able to		Assessment
1	• □ Students will be able to explain the principles and planning methods of the territorial organization of livestock farms.	
2	• □ Students will be able to analyze site selection and planning criteria appropriate for different branches of animal husbandry.	
3	• □ Students will acquire the ability to identify and assess factors affecting nature and the environment.	
4	• □ Students will be able to scientifically analyze impacts on water, soil, air, and biodiversity.	
5	• □ Students will develop the ability to plan and implement environmental safety measures in livestock farms.	
6	• □ Students will gain knowledge in waste management, reduction of environmental impacts, and preventive measures.	
7	• □ Students will be able to apply relevant regulatory-legal documents and international environmental standards.	

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
		Territorial organization of livestock farms: concept and objectives	
		Principles of siting livestock facilities and geographical factors	
		Efficient use of land resources and soil erosion protection measures	
		Water resource management and water-saving technologies in livestock farming	
		Waste management and recycling in livestock farms	
		Environmental impact assessment and ecological monitoring methods	
		Sanitary and hygiene standards in livestock facilities and their environmental impact	
		Biodiversity conservation and pasture management	
		Climate change and its impact on livestock farming	
		Organization of sustainable and environmentally safe livestock systems	
		Application of alternative energy sources in livestock farming (biogas, solar, wind)	
		Regulatory and legal framework: environmental protection legislation and standards	
		Ecological assessment of technological processes in livestock farms	
		Modern digital technologies and the concept of “smart farming”	
		Territorial specialization of livestock farms by regions and their ecological aspects	

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

- 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			
Total Workload/45(h)			
ECTS Credit of the Course			

MODULE HANDBOOK

Methods of Environmental Protection and Restoration master program, Department of "Ecology and Environment".

Course Unit Title	**Research methods**
Course Unit Code	
Type of Course Unit	Mandatory
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	
Practice (hour/week)	
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	

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

Objectives of the Course:

To provide students with a detailed understanding of environmental problem-solving using classical methods, as well as the application of natural and industrial environmental sample analysis. This includes the use of properties such as conductivity, radiation absorption or emission, mass-to-charge ratios, and related characteristics in inorganic, organic, and biochemical quantitative analyses.

Environmental research methods are mainly based on instrumental techniques, where students are taught how to analyze changes occurring as a result of the interaction between electromagnetic radiation and the investigated substance in a sample.

At the end of the course the student will be able to		Assessment
1	• To develop students' understanding of the mutual interactions between ecological factors and organisms, including the effects of organisms on the environment;	
2	• To develop students' understanding of global environmental problems;	
3	• To form students' understanding of the current ecological state of natural environments such as air, water, and soil;	
4	• To develop students' understanding of environmental research methods, including atomic absorption spectroscopy, mass spectrometry, inductively coupled plasma (ICP) spectrometry, chromatographic analysis, and extraction techniques.	
	•	

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
		Aim, tasks, and place of the course "Environmental Research Methods" within the system of sciences	
		Methods of soil research	
		Methodological foundations of environmental research	
		Soil ecological monitoring and protection from pollution using research methods	
		Urbanization and its environmental problems	
		Ecological-geographical characteristics of study areas in environmental research; GIS-based analysis methods	
		Special research methods in the study of plant and animal communities	
		Remote sensing methods in ecosystem studies	
		Impact of transport on the atmosphere and methods of problem-solving	
		Objectives, tasks, and methods of hydrogeological environmental monitoring	
		Ecological bioindication methods	
		Introduction to ArcGIS software	
		GIS and integrative approaches in modern environmental research	
		Wastewater disposal systems and methods	
		Modern technologies in environmental monitoring	

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

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
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ECTS allocated based on Student Workload

Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class			
Presentation			
Self-study			
Tutorials			
Midterm Examination			
Preparation for midterm exam			
Final Examination			
Preparation for final exam			
Total Workload			
Total Workload/45(h)			
ECTS Credit of the Course			

MODULE HANDBOOK

Methods of Environmental Protection and Restoration master program, Department of "Ecology and Environment".

Course Unit Title	**Environmental monitoring and GIS (Geographic Information Systems) software**
Course Unit Code	
Type of Course Unit	Mandatory
Level of Course Unit	
National Credits	
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	

Practice (hour/week)	
Laboratory (hour/week)	
Year of Study	
Semester when the course unit is delivered	
Course Coordinator	
Name of Lecturer (s)	Nurlan Ganbarov
Name of Assistant (s)	Nurlan Ganbarov
Mode of Delivery	Face to face
Language of Instruction	Azerbaijani
Prerequisites	-
Recommended Optional Program Components	-

Objectives of the Course:

The main objective of the course is to equip students with practical and analytical skills in environmental monitoring, assessment, and management through the use of GIS (Geographic Information Systems) technologies.

At the end of the course the student will be able to		Assessment
1	• □ Explains the concepts, objectives, and main methods of environmental monitoring.	
2	• □ Understands the role and application areas of Geographic Information Systems (GIS) in environmental monitoring.	
3	• □ Collects, structures, and manages ecological data related to soil, water, air, and biodiversity in a GIS environment.	
4	• □ Prepares thematic maps of environmental indicators using ArcGIS and/or QGIS software.	
5	• □ Analyzes spatial and temporal environmental changes and presents the results using maps and graphs.	
6	• □ Conducts spatial assessment of anthropogenic impacts and environmental risks.	
7	• □ Applies satellite imagery and remote sensing data for environmental monitoring purposes.	

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	
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4	ability to use the principles of automatic control, know digital computing technology, microprocessor technology, their application in instrument	

	making and industrial control	
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	
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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
		Installation and initial steps of the software; the essence of GIS and its application areas; downloading and installing ArcGIS Pro Logging in with an ArcGIS account Creating a new project Creating new shapefiles (point, line, polygon)	
		Editing tools – Part I (Edit menu) • Move, Edit Vertices • Reshape, Merge, Split • Rotate, Scale, Transform • Align Features, Move To • Replace Geometry, Continue Features • Extend or Trim, Fillet, Generalize • Line Intersection	
		Editing tools – Part II • Split, Divide, Clip • Explode, Planarize, Merge • Buffer, Copy Parallel	
		Attribute tables – Part I • Overview of the attribute table • Creating and editing fields • Selection and filtering methods	
		Attribute tables – Part II • Using Field Calculator • Concepts of Domain and Subtype • Join and Relate functions	

		Map and Project menus • Basic structure of maps • File management in the Project menu • Adding basemaps	
		Label properties • Layer labeling • Text formatting using expressions • Label placement types and settings	
		Symbology • Single Symbol • Unique Values • Graduated Colors • Charts and Heat Maps	
		Layer properties and ArcToolbox • Right-click functions on layers • Layer Properties window features • Application of the Dissolve tool • Feature tools in ArcToolbox	
		Printing – Part I (Print & Layout) • Creating a layout • Map composition concepts	
		Printing – Part II • Adding legend, scale bar, and north arrow • Exporting maps to PDF and other formats	
		Google Earth integration • Principles of working with Google Earth Pro • Import and export of KML/KMZ files • Use of Google Earth data in GIS	
		Imagery menu – Georeferencing • Raster data concepts • Georeferencing raster files • Adding control points • Transformation methods	
		Analysis menu and Toolboxes • Concept of geoprocessing • Overview of analysis toolboxes • Application of basic analysis tools	
		Spatial Analyst Tools – Surface analysis • Hillshade, Slope, Aspect analysis • Reclass tool • Raster to Polygon conversion	
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

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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			
Total Workload/45(h)			
ECTS Credit of the Course			