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Laboratory Technology Program

DESCRIPTION FORM OF COURSE

Course Code and Name: TRD101 Turkish Language-I				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	2	0	2	2	2	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Lecturer Seval PERK	**Mail :** sperk@munzur.edu.tr **Web :** https://akademik.yok.gov.tr/AkademikArama/view/viewAuthor.jsp
Aims of Course	It aims to show students the characteristics and rules of the Turkish Language with examples; to provide them with the skills and habits of expressing their feelings, thoughts, plans, impressions, observations, and experiences correctly and effectively in words and writing; to develop their vocabulary through written and spoken texts; to teach them the rules of correctly understanding the texts they read or the programs they listen to; and to develop their language skills, which are the basis of communication between individuals and masses.	
Course Learning Outcomes and Competencies	1. Will be able to have general information about the concept of language. 1.1. Definition and birth of language; culture, thought and communication. 1.2. Understands the differences between written language and spoken language. 2. Will be able to gain correct and planned writing skills. 2.1. Learns the details of paper layout and paragraph information. 2.2. Gains competence in written communication by doing writing studies. 3. Will be able to have information about spelling rules and punctuation marks. 3.1. Uses punctuation marks correctly in the text. 3.2. Eliminates ambiguity in written communication by learning the details of spelling rules. 4. Will be able to have general information about the rules of petition. 4.1. Learns how to write a petition correctly. 4.2. Applies the rules in official correspondence.	
Textbooks and /or Other Required Materials	Images/visuals, slides, videos and lecture notes on the course content.	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, Question-Answer, Discussion, Brainstorming, Individual Work, Team/Group Work	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Definition and Function of Language
2	Languages/Birth of Language
3	Written Language and Spoken Language
4	Paper Layout and Paragraph Information
5	Paragraph Plan
6	Writing and Writing Plan
7	Writing Practices
8	Midterm exam
9	Writing Rules
10	Writing Rules
11	Punctuation Marks
12	Punctuation Marks
13	Petition
14	Writing Studies
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: AIT101 Atatürk's Principles and Revolution History-I				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	2	0	2	2	2	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Lecturer Adem KIZKAPAN	**Mail :** akizkapan@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/tibbi/Pages/akadro.aspx
Aims of Course	It aims to let the student who attends the courses to acquire the ability of classification, description, explanation, analysis of the current social and individual problems in Turkey by taking rationality and science, norms of modernity into account with respect to the Kemalist thought and the Turkish Revolution	
Course Learning Outcomes and Competencies	1. Have knowledge about the developments in European History, and Ottoman modernization 2. Have knowledge about the causes of the Collapse of the Ottoman Empire 3. Have knowledge about the First World War 4. Have knowledge about the Turkish National Struggle 5. Have knowledge about the founding philosophy of the Republic of Turkey.	
Textbooks and /or Other Required Materials	Images/visuals, slides, videos and lecture notes on the course content.	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, Question-Answer	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Concepts Related to the Revolution
2	Developments in Europe
3	Ottoman Political Life
4	Political Developments Before World War I
5	World War I and the Ottoman
6	World War I and the Ottoman
7	National Struggle: Preparation Period
8	Midterm exam
9	Mustafa Kemal Pasha's Passage to Anatolia
10	Congress Period
11	Opening of the Turkish Grand National Assembly
12	National Struggle: Period of Wars
13	Mudanya Armistice
14	Treaty of Lausanne
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: YBD101 English-I				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	2	0	2	2	2	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Lecturer Dr. Eda TAYŞI	**Mail :** edataysi@munzur.edu.tr **Web :** http://munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/yabancıKultur/Pages/akadro_en.aspx
Aims of Course	To provide students with basic English knowledge and to enable them to use it in daily life.	
Course Learning Outcomes and Competencies	1. Will be able to introduce himself, his environment and his family with basic level of English. 1.1. Introduces himself verbally. 1.2. Expresses himself in writing. 2. Will be able to speak English with anyone at a basic level. 2.1. Speaks at A2 level. 2.2. Understands what he hears at A2 level. 3. Will be able to introduce the objects around him and make comparisons. 3.1. Makes definitions at A2 level. 3.2. Makes comparisons at A2 level. 4. Will be able to express his needs and desires at a basic level. 4.1. Requests his desires at a basic level in English. 4.2. Expresses himself in written and oral form. 5. Will be able to talk about current and past events and write with simple sentence structures. 5.1. Expresses himself in written and oral form. 5.2. Understands what is said at a basic level.	
Textbooks and /or Other Required Materials	Hutchinson,T. TABOR, C.QUINTANA, J. EADIE, K. English For Life. Oxford University Press Azar, B. Basic English Grammar	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, Question-Answer, Presentation	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Introduction to Course
2	Countries & Nationalities
3	Present Simple Tense
4	Present Simple Tense (Negatives& questions)
5	Common verb phrases
6	Wh- question words
7	Possessive -s Family Members
8	Midterm exam
9	Around Home (household objects)
10	Singular/Plural Nouns a/ an/ the
11	This/that/these/those
12	Colours and common adjectives
13	Can/ Can't
14	Present Continuous Tense
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: MAT101 Mathematics				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	2	0	2	2	3	Turkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Lecturer Muhlis ÇETİN	**Mail :**muhliscetin@munzur.edu.tr **Web :** http://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/muhasebeVergi/Pages/akadro.aspx
Aims of Course	To provide students with sufficient mathematical knowledge to solve the problems they encounter and to develop students' ability to think analytically and produce solutions to problems.	
Course Learning Outcomes and Competencies	1. Will be able to explain numbers and number sets. 1.1. Explains the positive natural number power of a natural number and shows the accuracy of the properties of exponential expressions. 1.2. Explains the concept of prime numbers and the fact that numbers are prime to each other with examples and divides a natural number into prime factors and finds the number of its positive divisors. 1.3. Specifies the properties of addition and multiplication operations by performing addition, subtraction, multiplication and division operations on the set of integers. 2. Will be able to show the properties related to operations in modular arithmetic and be able to perform operations. 2.1. Explains the concept of module with examples, indicates the concept of remainder class (equivalence class) and the set of remainder classes (Z/m set) according to the division operation with integers. 2.2. Performs addition and multiplication operations in the set Z/m and states their properties 3. Will be able to explain the absolute value of a real number and state the properties related to absolute value. 3.1. Knows the definition and properties of absolute value. 3.2. Solves problems using the properties of absolute value. 4. Will be able to explain square root and exponential expressions, state their properties and apply them. 4.1. Performs four operations on square root numbers. 4.2. Solves problems using the properties of exponential numbers. 4.3. Properties related to multiplication, division and powers of exponential expressions are examined algebraically.	

	5. Will be able to explain ratio and proportion. 5.1. Shows the properties of proportion and solves problems related to daily life. 5.2. Reminds the properties of ratio, proportion and proportion. 6. Will be able to define functions. 6.1. Finds the intervals in which the given function is defined and undefined. 6.2. Finds the inverse of the given function. 6.3. Defines the composite function and explains its properties.
Textbooks and /or Other Required Materials	1. General Mathematics , Mustafa Balcı, Balcı Publications, 2003. 2. Basic Mathematics, Basri Çelik, İsmail Naci Cangül, Nisa Çelik, Osman Bizim, Metin Öztürk; Dora Publications, 2010.
Method of delivery of the course	Face to face / Online
Teaching Methods and Techniques	Explanation, Demonstration, Question-Answer, Discussion

		If yes, please mark (X)	**Percentage (%) Contribution to the Overall Average**
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Numbers
2	Rational numbers
3	Decimal numbers
4	Exponential numbers
5	Radical numbers
6	Identities and factoring
7	Absolute value

8	Midterm exam
9	Simple inequalities
10	Ratio-proportion
11	Operation and modular arithmetic
12	Problems
13	Graph types and problems
14	Functions
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP103 General Chemistry				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	3	0	3	3	4	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Nagihan KARAASLAN AYHAN	**Mail :** nkaraaslan@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To ensure that students understand the basic concepts of chemistry and the importance of chemistry for their careers. Also, to provide the basic knowledge and skills needed in general chemistry.	
Course Learning Outcomes and Competencies	1. Will be able to define the basic concepts of chemistry (element, compound, mixture). 2. Will be able to explain atomic models and atomic nuclei. Will be able to explain concepts such as atom, electron, neutron, atomic mass, mass number, electron number, ionic charge. 3. Will be able to explain the symbols, groups and general group properties of elements and classify elements. 4. Will be able to understand chemical reactions and equations and will be able to name, form compounds and use the concept of mole. 5. Will be able to write and balance acid-base reactions by knowing the concepts of acid and base. 6. Will be able to apply the properties of gases, gas laws and ideal gas equation. 7. Will be able to explain concepts such as solution types, concentrations, vapor pressure. 8. Will be able to explain intermolecular forces by knowing the properties of solids and liquids. 9. Be able to distinguish between the concepts of enthalpy of formation and enthalpy of reaction and apply Hess's law.	
Textbooks and /or Other Required Materials	- Basic University Chemistry - Ender Erdik, Yüksel Sarıkaya, 22. Baskı, Gazi Bookstore, Ankara, 2014. - Modern University Chemistry Volume 1-2, C. E. Mortimer, Translators: Turhan Altınata et al, 5th Edition, Çağlayan Bookstore , İstanbul, 2004 - General Chemistry 1, Principles and Modern Applications, Petrucci, Harwood, Herring, Translation Editors: Tahsin Uyar, Serpil Aksoy, 10th Edition, Palme Publishing, Ankara, 2015	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, question-answer, discussion, practice	

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Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Basic Concepts; Matter, Properties and Classification of Matter, Element, Compound, Mixture and Other Chemical Concepts
2	Atomic Structure, Atomic and Molecular Weight, atom-gram
3	Introduction to the Periodic Table; Atomic Electron Structure, Electron Configuration Numbers and Orbits
4	Symbols and Valences of Elements, Ionic and Molecular Structure, Formation of Compounds and Writing and Naming of Compound Formulas
5	Chemical Equations, Composition by Weight, % Composition, Composition by Volume, Determination of Simple and Molecular Formulas
6	Mole Concept and Avogadro's Number, Mole Calculations, Chemical Reactions
7	Stoichiometry, Theoretical Yield, Experimental Yield
8	Midterm exam
9	Solutions
10	Gases, Gas Laws and Measurement of Gas Pressure
11	Chemical Thermodynamics
12	Chemical Balance
13	Acids and Bases
14	Liquids, Solids and Intermolecular Forces,
15	Final exam

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Course Code and Name: LTP107 Basic Information Technologies				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	1	2	3	2	3	Türkish	Compulsory
Prerequisites of Course	There are no prerequisites.						
Course Instructor	Lecturer Kürşat ARSLAN			**Mail :** kursatarslan@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/bilgisayarTekno/Pages/akadro.aspx			
Aims of Course	To promote the use of Information Technologies, improve computer literacy, and provide experience in operating systems, computer hardware, input-output devices, word processing, spreadsheets, and presentation preparation.						
Course Learning Outcomes and Competencies	1. Will recognize fundamental concepts of Information Technologies in detail 2. Will understand hardware and software components of a computer system in detail 3. Will be proficient at a basic level in the purpose and use of operating systems 4. Will be able to use a word processor software to meet professional needs 5. Will be able to use spreadsheet software to meet professional needs 6. Will be able to use presentation software to meet professional needs						
Textbooks and /or Other Required Materials	Instructor's notes						
Method of delivery of the course	Face to face, Online						
Teaching Methods and Techniques	Explanation, question-answer, presentation, practice, analysis						

		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Definition and Historical Development of Computers
2	Computer hardware components
3	Input Devices
4	Output Devices
5	System and Application Software
6	Operating Systems
7	Utility Programs
8	Midterm Exam
9	Windows Operating System
10	Introduction to and basic usage of Microsoft Office Word
11	Data entry and formatting in Word; document editing and adding images, tables, etc.
12	Introduction to and usage of Microsoft PowerPoint; slide design and special animations
13	Introduction to and basic usage of Microsoft Office Excel
14	Data entry and formatting in Excel; use of formulas, functions, and charts in spreadsheets
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP101 General Biology				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	2	0	2	2	3	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assist. Prof. Dr. Nesrin KARACA SANYÜREK	**Mail :** nkaraca@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	Definition and significance of biology, certain important biological fields and certain biological concepts, cellular structure, cellular membrane, cytoplasm and organelles, cell nucleus, cellular energy production, cellular respiration, photosynthesis event, chromosomes and nucleic acids.	
Course Learning Outcomes and Competencies	1. Students explain the general biological concepts. 1.1. Student define the sub-fields in biology. 2. Students have knowledge about the diversity and classification of living organisms. 2.1. Students categorize the living organisms. 2.2. Students evaluate the common properties of living organisms. 3. Students have knowledge of cellular structure and operation. 3.1. Students explain cellular structure. 3.2. Students explain the organelles and their functions. 4. Students explain the biochemical events in living organisms. 4.1. Students give examples of biochemical events. 4.2. Students describe the locations of biochemical events in living organisms. 5. Students have knowledge of the relationship between living organisms and the inanimate environment. 5.1. Students explain the relationships between living organisms.	
Textbooks and /or Other Required Materials	Images/visuals, slides, videos and lecture notes on the course content.	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, question-answer, discussion, presentaition	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Definition of biology, certain significant biological fields, and certain biological concepts.
2	Cellular structure and cellular organic and inorganic substances.
3	Classification of organisms based on cellular structure.
4	The properties of cellular membrane and wall, and their functions.
5	The permeability of the cellular membrane for certain substances.
6	Cytoplasm and physical and chemical properties of cytoplasm.
7	The properties and functions of the organelles in the cytoplasm.
8	The properties and functions of the organelles in the cytoplasm.
9	The structure and functions of the cell nucleus.
10	Midterm exam
11	Cellular energy production and cellular respiration.
12	Photosynthesis.
13	Factors that affect the photosynthesis speed.
14	Chromosomes and nucleic acids.
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP105 General Microbiology				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	2	2	4	3	4	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assist. Prof. Dr. Ferit Can YAZDIÇ	**Mail :** fcanyazdic@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/bitkisel/Pages/yonetim_en.aspx
Aims of Course	To explain the concepts of microbiology and microorganisms, to teach microbiology laboratory techniques and to provide knowledge and skills, especially in environmental microbiology.	
Course Learning Outcomes and Competencies	1. As a biological science, they will learn general information about microorganisms. 1.1. They can recognize and distinguish microorganisms 1.2. They know the basic characteristics of microorganisms 2. They will gain practice about general microbiology laboratories. 2.1. They will recognize the devices in the microbiology laboratory and use them in applications 2.2. They can apply microbial cultivation and production techniques 3. They will learn the basic information necessary for engineering applications related to microbiology. 3.1. They will decide which types of microorganisms can be used in which types of environmental applications 4. They will be able to establish a connection between microorganisms and environmental elements and comment on the relationship between them 4.1. They will comment on the relationship between soil and water quality and microorganisms	
Textbooks and /or Other Required Materials	Wastewater Microbiology, G.Bitton, , Wiley, Liss, Inc, 1994. Microbiology For Enviromental Scientists and Engineers, Gaudy, A.F., Gaudy,E.T., (1980)., McGrow Hill Book Company The Microbial World, Stanier, R.Y., Doudooff, M. And Adelberg, E.A., 3rd Fybate Lecture Notes, 1967, “General Bacteriology”, Berkeley, California	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Verbal and visual presentation, question and answer, discussion	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	History and Development of Microbiology, rules to be followed in the laboratory
2	Classification of living things, the world of microorganisms, introduction to the tools and materials used in the laboratory
3	Prokaryotic and eukaryotic cell structure, introduction to the microscope, examination of prokaryotic and eukaryotic microorganisms under the microscope
4	Prokaryotic organisms, dyes and dyeing methods
5	Bacteria, blue green algae, viruses, types of media, preparation of solid and liquid media for the production of microorganisms
6	Eukaryotic organisms, preparation of solid and liquid media for the production of microorganisms
7	Protozoa, algae, fungi, cultivation and culture methods
8	Midterm exam
9	The role of microorganisms in biochemical cycles, cultivation and culture methods
10	Energy production and consumption mechanisms, sterilization methods and operating the autoclave
11	Respiration, photosynthesis, fermentation, examination of microorganisms and determination of their sizes
12	Microbial metabolism characteristics, determination of coliform bacteria by multiple tube fermentation method
13	Microbial Enzymes, Microbial genetics, bacterial counting methods
14	Microbial genetics, bacterial counting methods
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP111 Biochemistry				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	3	0	3	3	3	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Yeliz IPEK	**Mail :** yelizipek@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To teach the basic characteristics of living things and biochemical examination of the structure of living things, to teach structure and functions of the main molecules and macromolecules found in living organisms. In a addition, to teach molecular structures and functions of biomolecules.	
Course Learning Outcomes and Competencies	1. Knows the components in living structure. Knows the importance of water for living things and the preparation of aqueous solutions. 2. Knows the structure and properties of carbohydrates. 3. Knows the structure and properties of lipids. 4. Knows the structure and properties of amino acids. 5. Knows the structure and properties of proteins. 6. Knows the structure and functions of enzymes and hormones.	
Textbooks and /or Other Required Materials	- Biochemistry, E. Keha, İ. Küfrevioğlu, 13th Edition, Aktif Publishing House, Ankara, 2020	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, question-answer, presentation, discussion	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Introduction to biochemistry
2	Chemical bonds and aqueous solutions
3	Biomolecules
4	Structure and properties of proteins
5	Amino acids
6	Enzymes
7	Structure and properties of carbohydrates, Monosaccharides
8	Midterm exam
9	Disaccharides,
10	Polysaccharides
11	Structure and properties of lipids
12	Fatty acids
13	Phospholipids,
14	Glycolipids and hormones
15	Final Exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LPT109 Occupational Safety and Health in the Laboratory				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	2	0	2	2	4	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assist. Prof. Dr. Nesrin KARACA SANYÜREK	**Mail :** nkaraca @munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To inform students about work accidents and occupational diseases in a laboratory environment, to determine the risks that may arise from physical, chemical and biological factors, to provide a safe working environment and to teach them how to take first aid and safety precautions.	
Course Learning Outcomes and Competencies	1. To learn the definition and history of work safety 2. To learn laboratory danger signs 3. To be able to apply the safety rules that should be followed in general in chemistry laboratories 4. To develop the awareness of taking the necessary precautions for safe work. 5. To be informed about the main safety standards that should be followed. 6. To understand the importance of laboratory safety. 7. To learn first aid practices in case of contact with chemicals, injuries and burns. 8. To be able to take precautions against chemical hazards spilled in the laboratory.	
Textbooks and /or Other Required Materials	Working Safely in the Laboratory, Ayhan Yılmaz, Expanded 2nd Edition, Hacettepe University Publications, Ankara, 2015.	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, presentation	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Definition of Laboratory Safety and Occupational Health and Safety
2	Importance of Safe Work Practices, Identifying Laboratory Hazards
3	Personal Hygiene and Safety in the Laboratory; Personal Protective Equipment
4	Risk Factors in Laboratories; Physical, Chemical, and Biological Risks
5	Laboratory Accidents and Preventive Measures
6	Laboratory Accidents and First Aid
7	Precautions for Storage and Handling of Chemicals
8	Midterm Exam
9	Chemical and Thermal Burns and Injuries; Preventive Measures
10	Inhalation, Absorption, and Poisoning from Chemicals
11	Classification of Chemicals
12	Fire and Fire Protection Methods
13	Chemical Waste and Disposal
14	Laboratory Glassware and Its Use
15	Final Exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: TRD102 Turkish Language-II				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	2	0	2	2	2	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Lecturer Seval PERK	**Mail :** sperk@munzur.edu.tr **Web :** https://akademik.yok.gov.tr/AkademikArama/view/viewAuthor.jsp
Aims of Course	To teach and/or remind the importance and subtleties of Turkish and to reinforce this with correct Turkish and its resources. In addition, to ensure that students use Turkish more consciously in daily conversations and correspondence throughout the course.	
Course Learning Outcomes and Competencies	1. Will be able to learn information for correct and proper expression. 1.1. Knows the importance of written expression and writes compositions. 1.2. Knows the rules of communication in oral expression. 2. Will be able to comprehend Turkish grammar. 2.1. Knows and applies sound events. 2.2. Understands morphology (root-stem-suffixes). 3. Will be able to analyze words in terms of their structure. 3.1. Develops and changes words. 3.2. Derives new words. 4. Uses the principles and techniques of speaking and discussion. 4.1. Applies Turkish spelling rules in speaking and discussion. 4.2. Can notice and correct expression errors in oral and written expressions.	
Textbooks and /or Other Required Materials	Zeynep Korkmaz ve ark., Türk Dili ve Kompozisyon Bilgileri, 6. Baskı, Ankara: Yargı Yayınevi, 2003. Yusuf Çotuksöken, Türk Dili, c. I-II, Papatya yay., 2003. Akın Önen, Türkçeyi Türkçe Konuşmak (Diksiyon - Spikerlik - Etkili Konuşma), İnkılap Yayınevi, İstanbul, 2007. Mustafa Durmuş, Türk Dili El Kitabı, Grafiker Yay., 2009. Muharrem Ergin, Türk Dil Bilgisi, Bayrak Basım Yayım Tanıtım, İstanbul, İbrahim Delice, Türkçe Sözdizimi, Kitabevi Yay., 2007.	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, Question-Answer, Discussion, Brainstorming, Individual Work, Team/Group Work	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan

Week	Syllabus
1	Punctuation marks (Period, comma, semicolon, colon, exclamation point …)
2	Spelling rules (Writing of capital letters, numbers, compound words)
3	Spelling rules (Writing of idioms, reduplications, loanwords and foreign proper names)
4	Spelling rules (Writing of abbreviations and some suffixes)
5	Composition (definition, purpose, methods of being successful in composition)
6	Methods in writing composition (formation of supporting and main ideas, planning)
7	Methods in writing composition (paragraph creation, methods of developing thought in paragraph)
8	Midterm Exam
9	Expression characteristics
10	Expression characteristics
11	Expression disorders
12	Types of expression (oral expression)
13	Types of expression (written expression: resume, petition...)
14	Types of expression (written expression: story, novel, theater, poetry...)
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: AIT102 Atatürk's Principles and Revolution History-II				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	2	0	2	2	2	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Lecturer Adem KIZKAPAN	**Mail :** akizkapan@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/tibbi/Pages/akadro.aspx
Aims of Course	Understanding the Turkish National Struggle and Atatürk's Principles and Revolutions	
Course Learning Outcomes and Competencies	1. Have knowledge about Ataturk's reforms 2. Have knowledge about the Turkish Foreign Policy in Ataturk's period 3. Have knowledge about Ataturk's principles 4. Have basic level of knowledge about the political developments in Turkey and the world during and after the Second World War.	
Textbooks and /or Other Required Materials	Images/visuals, slides, videos and lecture notes on the course content. Speech; Publication of the Ministry of Culture and Tourism of the Republic of Turkey Ataturk's Principles and History of Revolution I-II, Council of Higher Education, Ankara, 1986.	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, Question-Answer, Presentation	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Revolutionary Movements in the Political Field
2	Revolutionary Movements in the Legal Field
3	Revolutionary Movements in the Education and Culture Field
4	Regulation of Social Life, Developments in the Economic Field, Health Services, Turkish Foreign Policy in the Atatürk Period
5	Principles on which the Turkish Revolution is based and the characteristics of the Turkish Revolution
6	Republicanism, Nationalism and Populism
7	Secularism
8	Midterm exam
9	Statism, Revolutionaryism
10	National Sovereignty, National Independence
11	National Unity and Solidarity, Territorial Integrity, Peacemaking
12	Scientificity, Rationalism, Modernity and Westernization, Humanity and Love of Humanity, Characteristics of the Turkish Revolution
13	Death of Atatürk, Aspects at Home and Abroad
14	Developments After World War II
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: YBD102 English-II				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	2	0	2	2	2	Türkish	Compulsory
Prerequisites of Course	There are no prerequisites.						
Course Instructor	Lecturer Dr. Eda TAYŞI		**Mail :** edataysi@munzur.edu.tr **Web :** http://munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/yabancıKultur/Pages/akadro_en.aspx				
Aims of Course	To provide students with knowledge of English grammar and to enable them to use it in daily life.						
Course Learning Outcomes and Competencies	1. Will be able to learn the tenses used in English. 1.1. Knows that Present Continuous Tense will be used in the present tense. 1.2. Learns that Past Tense will be used in the past tense. 2. Will be able to make dialogues in English and use the tenses he/she learned. 2.1. Learns formulaic words in dialogues. 2.2. Learns dialogues on dating, travel, accommodation and health. 3. Will be able to read English texts. 3.1. Reads and comments on English stories. 3.2. Reads English newspaper articles. Translates them into Turkish.						
Textbooks and /or Other Required Materials	Hutchinson,T. TABOR, C.QUINTANA, J. EADIE, K. English For Life. Oxford University Press Azar, B. Basic English Grammar						
Method of delivery of the course	Face to face / Online						
Teaching Methods and Techniques	Explanation, Question-Answer, Presentation						

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Simple Present Tense
2	Present Continuous Tense
3	Simple Past Tense
4	Past Continuous Tense
5	Present Perfect Tense
6	Past Perfect Tense
7	Future Tense
8	Midterm Exam
9	Adjectives
10	Adverbs
11	Making Suggestions, Tag Questions
12	Translation from English to Turkish, from Turkish to English
13	Reading, analyzing, interpreting, and evaluating English texts
14	General Evaluation
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP110 Laboratory Equipment Maintenance and Use				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	2	1	3	2.5	4	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Yeliz IPEK	**Mail :** yelizipek@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To teach the purposes of use, features, working principles, types and post-use maintenance of general purpose tools and devices used in the laboratory.	
Course Learning Outcomes and Competencies	1. Recognizes basic laboratory instruments 2. Knows the features and intended uses of basic laboratory instruments. 3. Knows what to pay attention to when using basic laboratory instruments 4. Knows how to clean and maintain basic laboratory instruments.	
Textbooks and /or Other Required Materials	Laboratory Techniques, Canan Dözen, Süreyya Saltan Evrensel, Nobel Publishing Distribution, Ankara, 2006. personal lecture notes	
Method of delivery of the course	Face to face Online	
Teaching Methods and Techniques	Theoretical course and laboratory applications	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Glassware used in the laboratory,
2	Safety equipments
3	Tools and devices used for mixing
4	Magnetic stirrer, mechanical mixer
5	Ultrasonic homogenizer, vortex, shaker
6	Tools and devices used for heating
7	Magnetic stirrer with heater, burner, oven
8	Midterm Exam
9	Balloon heater, furnace, jacketed heating system
10	Ultrapure water device
11	Distilled water device
12	Ultrasonic bath, Centrifugal device
13	pH meter
14	Optic microscope
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP112 Analytical Chemistry -I				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	3	0	3	3	4	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Berna KOÇAK	**Mail :** bernakocak@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To teach chemistry students basic analytical chemistry concepts and to provide them with the skills to perform qualitative and quantitative analysis of samples	
Course Learning Outcomes and Competencies	1- Recognize basic analytical chemistry concepts. 1.1- Explain gravimetric and titrimetric analysis 1.2- Distinguish qualitative and quantitative analysis 2- Apply the rules to be considered when performing analysis and preparing solutions. 2.1- Use analytical chemistry concepts in problem solving. 2.2- Perform basic analytical chemistry experiments. 3- Relate errors that may be encountered in chemical analysis and their elimination methods. 3.1- Learn to calculate confidence limit and determination limit 3.2.- Evaluate experimental results 4. Learn titrimetric analysis methods. 4.1. Have general information about standard solution. 4.2. Learn volumetric calculations.	
Textbooks and /or Other Required Materials	Analytical Chemistry-Basic Principles, 8th Edition; D. A. Skoog; D. M. West; F.J. Holler; S.R. Crouch. ThomsonPub.. US. (2004) (Translation Editors: E. Kılıç ve H. Yılmaz- Bilim Publishing- Ankara) Analytical Chemistry, D.C. Haris, W.H. FreemanandCompany, US, (1982). (Translation Editors: G. Somer- Gazi Büro Bookstore -1994.) Notes and experimental studies prepared by the lecturer	
Method of delivery of the course	Face to face, Online	
Teaching Methods and Techniques	Explanation, question-answer, discussion, practice	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	1. Midterm Exam	X	40
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	60

Semester Course Plan	
Week	**Syllabus**
1	Equipment and Basic Operations in Analytical Chemistry Sampling, Standardization and Calibration
2	Calculations in Analytical Chemistry
3	Errors in Chemical Analysis
4	Random Errors in Chemical Analysis
5	Statistical Data Processing and Evaluation
6	Aqueous Solutions and Chemical Equilibrium
7	Aqueous Solutions and Chemical Equilibrium
8	Midterm Exam
9	Effect of Electrolytes on Chemical Equilibrium
10	Solution of Equilibrium Problems in Complex Systems;
11	Solution of Equilibrium Problems in Complex Systems;
12	Gravimetric Analysis Methods;
13	Gravimetric Analysis Methods; Introduction to Titrimetric Methods
14	Titrimetric Methods- Precipitation Titrimetry.
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP104 Organic Chemistry				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	3	0	3	3	4	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Esra BARIM	**Mail :** esrabarim@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To provide understanding of the basic concepts of organic chemistry and the classification and clear structures of organic compounds. To provide basic knowledge and skills in organic chemistry.	
Course Learning Outcomes and Competencies	1. Learns the basic concepts of organic chemistry 2. Understands organic compounds and carbon bonding 3. Understands organic functional groups 4. Learns about isomers. 5. Learns the structures and naming of organic compounds. 6. Learns simple reaction mechanisms. 7. Understands and understands simple reactions. 8. Learns about stereochemistry.	
Textbooks and /or Other Required Materials	Organic Chemistry, Graham Solomons - Craig Fryhle Translation from the 11th Edition - Abridged Edition, Literatür Publishing, İstanbul, 2020	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, presentation, molecular models	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Introduction to organic chemistry
2	Chemical bonds, Lewis dot structures
3	Formal load and Resonance
4	Demonstration of structure formulas
5	Substitution Reactions
6	Hydrocarbons Alkanes
7	Hydrocarbons Alkenes
8	Midterm Exam
9	Hydrocarbons Alkynes
10	Hydrocarbons Aromatic hydrocarbons
11	Alcohols and Ethers
12	Aldehydes and Ketones
13	Carboxylic acids
14	Esters and aliphatic ammonia derivatives
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP108 Analytical Chemistry Laboratory-I				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	0	3	3	1.5	4	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Berna KOÇAK	**Mail :** bernakocak@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To understand the basic analytical separation concepts and the identification of cations and anions in known and unknown sample mixtures.	
Course Learning Outcomes and Competencies	1. Learn general rules to be observed in the laboratory. 1.1. They learn how to perform laboratory accidents and first aid. 1.2. They learn points to be observed during analytical work. 2. They gain general information about systematic analysis of cation analyses. 2.1. They can write reactions during cation analyses. 2.2. They can apply cation analyses. 3. They gain general information about systematic analysis of anion analyses. 3.1. They can write reactions during anion analyses. 3.2. They can apply anion analyses. 4. They gain general information about qualitative analysis. 4.1. They can determine anion or cation qualitatively by analyzing unknown samples. 4.2. They have the ability to apply qualitative analysis methods.	
Textbooks and /or Other Required Materials	Qualitative Analysis Lab notes**,** G. Somer, A.R. Türker, E. Hasdemir, O. ŞENDİL, Ü. ŞANSAL, M.S. KARACAN, H. ARSLAN ve A. TUNÇELİ Notes and experimental studies prepared by the lecturer	
Method of delivery of the course	Face to face, Online	
Teaching Methods and Techniques	Explanation, question-answer, discussion, practice, laboratory experiments	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	General information about the laboratory.
2	Analysis of 1st Group Cations
3	Analysis of 2nd Group Cations
4	Analysis of 3rd Group Cations
5	Analysis of 4th Group Cations
6	Analysis of 5th Group Cations
7	Cation Analysis in real sample
8	Midterm Exam
9	Analysis of 1st Group Anions
10	Analysis of 2nd Group Anions
11	Analysis of 3rd Group Anions
12	Analysis of 4th Group Anions
13	Analysis of 5th Group Anions
14	Determination of anions and cations in real sample
15	Final Exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP102 General Chemistry Laboratory				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	0	3	3	1.5	4	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Yeliz İPEK	**Mail :** yelizipek@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	Teaching some basic chemical experiments and observations in practice and gaining the ability to perform basic laboratory operations. In a addition,teaching laboratory eqipments, rules and basic laboratory processes with experimental studies.	
Course Learning Outcomes and Competencies	1. Interprets the Basic Principles of General Chemistry. 2. Applies solution preparation in the laboratory. 3. Practices working as a team in a laboratory environment. 4. Evaluates the Physical and Chemical Properties of Chemical Compounds. 5. Practices Setting Up Chemistry Experiments. 6. Explains Chemical Stoichiometric Calculations. 7. Formulates and Interprets Chemical Compounds.	
Textbooks and /or Other Required Materials	Notes and experimental studies prepared by the lecturer	
Method of delivery of the course	Face to face/Online (Virtual Laboratory Project (YÖK SanLab))	
Teaching Methods and Techniques	Laboratory experiments	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam (Practical exam)**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Semester final exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Introducing the laboratory and grouping the students for experimental studies
2	Laboratory rules
3	Glassware and basic tools and equipment used in the laboratory
4	Solution preparation
5	Determination of the solubility of a salt
6	Stoichiometric calculations
7	pH and indicators
8	Midterm exam
9	Acid-base titration
10	Heat of dissolution and heat of reaction calculation
11	Determination of acid in vinegar
12	Repeating experiments
13	Repeating experiments
14	Repeating experiments
15	Final exam

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Course Code and Name: LTP210 Clinical Biochemistry and Analyses					**Program: Laboratory Technology**		
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	2	1	3	2,5	4	Turkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assist. Prof. Dr. Aygün KILIÇ	**Mail :** aygunkilic@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To acquisition of the knowledge on the basic function of clinical biochemistry laboratory and how to use and interpret biochemical tests required for diagnosis and treatment of patients.	
Course Learning Outcomes and Competencies	1. Students explain the organization of clinical biochemistry laboratory. 2. Students categorize clinical biochemical analyzes. 3. Students explain the factors that affect laboratory test results. 4. Students indicate quality control methods in clinical biochemistry laboratory. 5. Students describe the procurement and transportation of clinical biochemistry laboratory material. 6. Students explain the kidney and urine biochemistry.	
Textbooks and /or Other Required Materials	Mehmetoğlu, İ. (2013). Handbook of Clinical Biochemistry. Nobel Tıp Publishing, Istanbul.	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, question-answer, discussion presentaition	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan

Week	Syllabus
1	Clinical biochemistry and organization of clinical biochemistry laboratories.
2	Clinical biochemistry laboratory rules.
3	Classification of clinical biochemical analyses.
4	Factors that affect the laboratory test results.
5	Factors that affect the laboratory test results.
6	Quality in clinical biochemical laboratory.
7	Procurement, transportation, and process of clinical biochemical laboratory materials.
8	Midterm exam
9	Procurement, transportation, and process of clinical biochemical laboratory materials.
10	Collection of the blood samples.
11	The composition and functions of blood.
12	Plasma proteins.
13	Kidney and urine biochemistry.
14	Identification of kidney pathologies.
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP201 Analytical Chemistry-II				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	3	0	3	3	4	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Berna KOÇAK	**Mail :** bernakocak@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To teach the types and applications of titrations that are important for quantitative analysis in analytical chemistry and the principles and applications of electroanalytical chemistry.	
Course Learning Outcomes and Competencies	1. Learn the applications of neutralization titrations. 1.1. Learn the reagents required for neutralization titrations. 1.2. Learn the sources of error that may occur in neutralization titrations. 2. Learn the methods used in deriving titration curves for complex acid/base systems. 2.1. Learn how to derive titration curves of mixtures of strong and weak acids or strong and weak bases. 2.2. Learn how to prepare buffer solutions containing polyprotic acids. 3. Learn general information about precipitation titrimetry. 3.1. Learn how to derive titration curves for anions and anion mixtures. 3.2. Learn the turning points and indicators used in argentometric titrations. 4. Learn general information about complex formation titrations. 4.2. Learn the methods using EDTA. 4.1. They learn how to derive EDTA titration curves. 5. They learn general information about electrochemistry. 5.1. They learn about the applications of standard electrode potentials. 5.2. They learn about the applications of oxidation/reduction titrations.	
Textbooks and /or Other Required Materials	Analytical Chemistry-Basic Principles, 8th Edition; D. A. Skoog; D. M. West; F.J. Holler; S.R. Crouch. ThomsonPub. US. (2004); (Translation Editors: E. Kılıç ve H. Yılmaz- Bilim Publishing- Ankara) Analytical Chemistry , D.C. Haris, W.H. FreemanandCompany, US, (1982). (Translation Editors ; G. Somer- Gazi Büro Bookstore -1994) Notes and experimental studies prepared by the lecturer	
Method of delivery of the course	Face to face /Online	
Teaching Methods and Techniques	Explanation, question-answer, discussion, practice	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Principles of Neutralization Titrations
2	Principles of Neutralization Titrations
3	Titration Curves for Complex Acid-Base Systems
4	Titration Curves for Complex Acid-Base Systems
5	Applications of Neutralization Titrations
6	Complexation Reactions and Titrations
7	Complexation Reactions and Titrations;
8	Midterm Exam
9	Introduction to Electrochemistry, Principles of Electroanalytical Chemistry
10	Principles of Electroanalytical Chemistry
11	Applications of Standard Electrode Potentials
12	Applications of Standard Electrode Potentials
13	Principles of Oxidation-Reduction Titrations
14	Applications of Oxidation-Reduction Titrations
14	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP207 Analytical Chemistry Laboratory-II				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	0	3	3	1.5	3	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Berna KOÇAK	**Mail :** bernakocak@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To provide experience in using and developing some basic measurement and analysis methods. To provide the ability to think and interpret experimental data.	
Course Learning Outcomes and Competencies	1. They gain knowledge about laboratory accidents and first aid. 1.1. They learn the rules to be followed and observed in the laboratory. 1.2. They gain knowledge about materials to be used in quantitative analysis and solution preparation. 2. They gain general information about gravimetric analysis. 2.1. They learn what the terms such as gravimetric precipitation, filtration, washing, bringing to constant weight mean and can apply these processes. 2.2. They can perform quantitative analysis with gravimetric methods. 3. They gain general information about volumetric analysis. 3.1. They can easily prepare the solutions required for volumetric analysis. 3.2. They can perform quantitative analysis with volumetric analysis. 4. They gain general information about redox titrations, iodometric, iodimetric methods. 4.1. They can apply redox titrations, iodometric, iodimetric methods. 4.2. They can apply titrations based on complex formation.	
Textbooks and /or Other Required Materials	Quantitative Analysis Lab Notes, G. Somer, A.R. Türker,E. Hasdemir et al., Fundamentals of Analytical Chemistry, D. Skoog and D. West, S. College Pub. US, 1999	
Method of delivery of the course	Face to face/Online	
Teaching Methods and Techniques	Explanation, question-answer, discussion, practice, laboratory experiments	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	General information about the laboratory.
2	Information about gravimetric and volumetric analysis
3	Acid-base titrations
4	Neutralization titrations
5	Analysis of weak acids
6	Analysis of carbonates and carbonate mixtures
7	Precipitation titrations
8	Midterm Exam
9	Precipitation titrations
10	Redox titrations
11	Redox titrations
12	Titrations Based on Complex Formation
13	Titrations Based on Complex Formation
14	Iodometric and Iodimetric Methods
15	Final Exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP215 Analytical Separation Methods				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	2	0	2	2	2	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Esra BARIM	**Mail :** esrabarim@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To teach the basic principles on which analytical methods are based and their application areas used to separate components in various samples.	
Course Learning Outcomes and Competencies	1. Explain and interpret the importance of separation methods in chemical analysis. 1.1 Be able to select, apply and evaluate the results of a method to separate a component in a sample. 1.2.Explain the differences between separation methods. 2. Have general information about chromatography. 2.1. Be able to classify chromatographic methods. 2.2. Learn the terms related to chromatographic methods. 3.1. Learn about gas chromatography. 3.2. Learn about the working principle of gas chromatography. 4. Learn about high-performance liquid chromatography. 4.1 Learn about the working principle of high-performance liquid chromatography. 4.2. Be able to make chromatographic applications and calculations.	
Textbooks and /or Other Required Materials	Instrumental Analysis Principles, D.A. Skoog, F.J. Holler, T.A. Nieman, Bilim Publishing house, Ankara,1998	
Method of delivery of the course	Face to face, Online	
Teaching Methods and Techniques	Explanation, question-answer, presentation	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Introduction of the course, general information about the purpose and classification of analytical separation methods
2	Physical separation methods
3	Distillation
4	Extraction
5	Introduction to chromatography, classification, important terms and concepts in chromatography
6	Basic reactions in chromatographic separations (separation mechanisms)
7	Separation mechanisms, applications of chromatography
8	Midterm Exam
9	Paper chromatography
10	Thin layer chromatography
11	Column chromatography
12	Gas chromatography
13	High performance liquid chromatography
14	Supercritical fluid chromatography
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP203 Water Analysis				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	2	1	3	2,5	3	Turkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assist. Prof. Dr. Aygün KILIÇ	**Mail :** aygunkilic@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To acquire theoretical and practical knowledge on water analyses.	
Course Learning Outcomes and Competencies	1. Students explain the structure and properties of water. 2. Comprehension of the properties and the negative effects of water. 3. Classification of water based on the source and intended use. 4. Students collect a water sample in accordance with water analysis rules. 5. Students state the physical, chemical and microbiological water analysis methods. 6. Students evaluate and report water analysis results.	
Textbooks and /or Other Required Materials	The Fields of Laboratory Services Water Analysis Course MEGEP Modules.	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, question-answer, discussion presentaition, practice	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)	X	**60**
	Semester final exam		

Semester Course Plan

Week	Syllabus
1	The structure of water, the significance of water in our lives, properties of drinking and irrigation waters.
2	Water classification and water types based on the source and utilization purpose.
3	Quality in water and the significance of water analysis.
4	Sample types and collecting water samples based on the objective of the analysis.
5	Collecting the general water sample and collecting the water sample in the field.
6	Water sampling material and equipment and sampling locations.
7	Water sampling for physical and chemical analyses.
8	Midterm exam
9	Bacteriological sampling in drinking and irrigation water.
10	Transportation and storage of water samples.
11	Water sampling frequency and evaluate of water analysis.
12	Determination of hardness and ammonia in water. Determination of the water taste, temperature and color.
13	Calculation of water pH and determination of turbidity in water.
14	Determination of chloride and nitrate in water.
15	Practice Exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP213 Soil Analysis				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	2	1	3	2.5	3	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Prof. Dr. Ragıp ADIGÜZEL	**Mail :** radiguzel@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To teach the importance, purpose and principle of taking soil samples, preparing them for analysis, as well as physical and chemical soil analysis and soil nutrient analysis.	
Course Learning Outcomes and Competencies	1. Knows the conditions of taking samples, preparing them for analysis and storing them in soil analysis. 2. Can perform physical and chemical soil analyses. 3. Has information about soil, its content and types. 4. Defines soil fertility analyses. 5. Establishes a relationship between the physical and chemical properties of soil and soil fertility. 6. Defines soil fertility analyses. 7. Can examine the relationship between soil content and plants. 8. Understands the importance of soil analyses.	
Textbooks and /or Other Required Materials	Soil Analysis, Burhan Kaçar, Expanded 2nd Edition , Nobel Publications, Ankara, 2009	
Method of delivery of the course	Face to face/Online	
Teaching Methods and Techniques	Explanation, question-answer, presentation, practice, analysis	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Soil parent material and soil classification
2	Plant nutrients found in soil
3	Taking soil samples and preparing them for analysis
4	Soil analysis monitored parameters and applied methods
5	Explanation and exemplification of units used in the preparation of solutions used in soil sample analysis
6	Taking soil samples and preparing them for analysis, drying, grinding, sieving and storage methods
7	Physical and chemical soil analyses
8	Mıdterm Exam
9	Physical and chemical soil analyses
10	Physical and chemical soil analyses
11	Physical and chemical soil analyses
12	Soil nutrient analyses
13	Soil nutrient analyses
14	Soil nutrient analyses
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP205 Plant Analysis				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	2	1	3	2.5	3	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Prof. Dr. Ragıp ADIGÜZEL	**Mail :** radiguzel@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To provide general information about plant physiology and preparation of plant samples for analysis and to understand the importance and principle of plant analysis.	
Course Learning Outcomes and Competencies	1. Learn the importance of plant analysis 2. Learn the concentration units used in plant analysis 3. Know how to perform nutrient element analysis in plants. 4. Learn the methods of burning plant samples 5. Interpret the plant analysis results	
Textbooks and /or Other Required Materials	Plant Analysis, Burhan Kaçar, Ali İnal, Nobel Publications, Ankara, 2008	
Method of delivery of the course	Face to face/Online	
Teaching Methods and Techniques	Explanation, question-answer, presentation, practice, analysis	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Introduction to the plant system
2	Physiological events in the plant
3	Uptake and transport of water and nutrient elements in the plant
4	Purpose and importance of plant analysis
5	Basic concentration units used in plant analysis
6	Taking plant samples and preparing them for analysis
7	Burning of plant samples (Dry burning and wet burning)
8	Midterm exam
9	Determination of phosphorus, potassium, calcium, magnesium contents in plant samples
10	Pigment analysis in plant samples
11	Iron and manganese analysis in plant samples
12	Zinc and copper analysis in plant
13	Determination of heavy metal content in plant samples
14	Interpretation of plant analysis results
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP216 Vocational Education Study				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	2	2	4	3	8	Turkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Güzin PIHTILI YILDIZ	**Mail :** gpihtili@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/ascilik/Pages/akadro.aspx
Aims of Course	To prepare students for their professional lives, to guide them in determining their career goals and to enable them to work in their field. .	
Course Learning Outcomes and Competencies	1. Can demonstrate that he/she has acquired a solid foundation in the legal, professional and ethical framework related to the field of study he/she is interested in. 2. Can develop the ability to analyze and use this ability in different areas related to his/her profession. 3. Can solve work-related and interpersonal problems by using organizational skills in areas related to his/her profession.	
Textbooks and /or Other Required Materials	1. Institution/University Databases/Articles where they will conduct research and investigation	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, presentation, discussion, practice	

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Evaluation Criteria		**If yes, please mark (X)**	**Percentage (%) Contribution to the Overall Average**
	1. Midterm Exam	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)	X	**60**
	Semester final exam		

Semester Course Plan	
Week	**Syllabus**
1	General information about the topics he/she will research for his/her profession
2	Selection of topics he/she will research for his/her profession and distribution to groups
3	Studying the topics he/she will research for his/her profession
4	Studying the topics he/she will research for his/her profession
5	Studying the topics he/she will research for his/her profession
6	Studying the topics he/she will research for his/her profession
7	Explaining the preliminary preparations for the studies in class
8	Midterm Exam
9	Studying the topics he/she will research for his/her profession
10	Studying the topics he/she will research for his/her profession
11	Oral presentation of the studies he/she will conduct
12	Oral presentation of the studies he/she will conduct
13	Oral presentation of the studies he/she will conduct
14	Oral presentation of the studies he/she will conduct
15	Final exam/practice exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTB203 Textiles and Dyestuffs				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	2	0	2	2	2	Türkish	Elective

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Esra BARIM	**Mail :** esrabarim@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To provide information about dyeing applications by considering the chemical properties of textile fibers and dyeing and to increase the knowledge and skills of students who will work in the textile industry.	
Course Learning Outcomes and Competencies	1. Learn the definition and history of textile. 2. Define natural and artificial fibers. 3. Explain the chemical structure and properties of some textile materials. 4. Define the production and consumption of dyes. 5. Define the chemical structures of textile dyes.	
Textbooks and /or Other Required Materials	Dyestuff and Textile Chemistry, Adem Önal, Bilim Kent Publishing, Bursa, 2022	
Method of delivery of the course	Face to face/Online	
Teaching Methods and Techniques	Explanation, presentation	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Absorption of Light, Color and Chromaticity Theories, Structure.
2	Textile Materials and Classification
3	Dye and Effect of Chromophore-Auxochrome Groups in Dye
4	Dye Substance Interaction, Hypsochromic-Batochromic Effect
5	Classification of Dyes
6	Leuco Dyes and Their Application
7	Mordant Dyes and Their Application
8	Midterm Exam
9	Azo Dyes, Formazans
10	Tetrazoles, Triphenylmethane Dyes
11	Some Dyeing Techniques
12	Dyeing Stages
13	Pigments
14	Natural Dyes
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LNT205 Nano Technology and Application Areas				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	2	0	2	2	2	Türkish	Elective

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Yeliz IPEK	**Mail :** yelizipek@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To teach the basics and terminology of nanotechnology and to provide information about current areas of use.	
Course Learning Outcomes and Competencies	1. Explains the basic concepts related to nanotechnology, 2. Follows and explains the innovations/developments related to nanotechnology, 3. Examines and applies the advantages/disadvantages of the methods used in nanotechnology.	
Textbooks and /or Other Required Materials	Notes prepared by the lecturer	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, question-answer, presentation, discussion	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Definition and concept of nanotechnology
2	Electron microscope
3	Nanomaterial production techniques
4	Topdown production techniques
5	Bottom-up production techniques
6	Nanotubes
7	Application areas of nanotechnology
8	Midterm Exam
9	Applications in the field of health
10	Applications in the field of textiles
11	Applications in the field of building materials
12	Applications in the field of agriculture
13	Applications in the field of energy
14	Homework presentations
15	Final Exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP212 Industrial Analysis Techniques				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	2	1	3	2.5	4	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Prof. Dr. Ragıp ADIGÜZEL	**Mail :** radiguzel@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To learn about the importance of the chemical industry in the industrial field and industrial processes. To understand the principle of industrial analysis methods and the importance and purpose of analysis in order to make quality production in the industrial field.	
Course Learning Outcomes and Competencies	1. Understands industrial processes and the characteristics of the products obtained. 2. Evaluates the analysis results encountered in the industry. 3. Takes the most appropriate and accurate sample for industrial analysis. 4. Determines the analysis method to be used in a new chemical process. 5. Can conduct interdisciplinary studies. 6. Follows current issues related to the field of study. 7. Can report analysis results. 8. Recognizes the main methods used in the chemical industry.	
Textbooks and /or Other Required Materials	Chemical Process Industries I and II, Çataltaş İ., Inkılap Publishing House, İstanbul, 1999. Inorganic Industrial Chemistry , Sanıgök Ü., Istanbul University Publication 1987. Organic Industrial Chemistry, Alpar, S. R., Istanbul University Publication,1973.	
Method of delivery of the course	Face to face/Online	
Teaching Methods and Techniques	Explanation, question-answer, presentation, practice, analysis	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Industry Definition and Industrial Processes
2	Fuel Analysis
3	Cement and Analysis
4	Cement and Analysis
5	Liquid Detergent Preparation
6	Chemical Fertilizer and Analysis
7	Chemical Fertilizer and Analysis
8	Midterm Exam
9	Glass and Analysis
10	Lime and Analysis
11	Petrochemical products
12	Petrochemical product analysis
13	Biodiesel production
14	Bioethanol production
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP214 Food Analysis				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	2	1	3	2.5	4	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assist. Prof. Dr. Nesrin KARACA SANYÜREK	**Mail :** nkaraca@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/ascilik/Pages/akadro.aspx
Aims of Course	To teach the principles and applications of basic analyses applied in the food field and the application of these analyses to various foods.	
Course Learning Outcomes and Competencies	1. Learns food control, experimental skills, and the duties and authorities of food inspectors, as well as sampling 2. Learns some basic chemical analyses (dry matter determination, elemental analysis) performed on foodstuffs 3. Can perform sensory and microbiological analyses 4. Interprets the basic content of meat and meat products, aquatic products, flour and bakery products, drinking and utility water, cooking oils and honey analyses. 5. Evaluates analyses	
Textbooks and /or Other Required Materials	Food Analysis, Canan Dokuzlu Hecer, Extended 3rd Edition, Marmara Bookstore, Bursa, 2010	
Method of delivery of the course	Face to face/Online	
Teaching Methods and Techniques	Explanation, question-answer, presentation, practice, analysis	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Introduction to food analysis
2	Importance of quality control and consumer safety in foods
3	Analysis of Milk and its products.
4	Basic physical, chemical, microbiological and sensory analyses applied to foods (various foods)
5	Basic physical, chemical, microbiological and sensory analyses applied to foods (various foods).
6	Importance of quality control and consumer safety in foods.
7	Analysis of meat and its products
8	Midterm exam
9	Analysis of cooking oils
10	Honey analyses
11	Evaluation of the analyses performed
12	Residue and additive analyses
13	Analysis of seafood
14	Examination of current issues related to food analyses
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP208 Environmental Chemistry				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	2	0	2	2	2	Turkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Güzin PIHTILI YILDIZ	**Mail :** gpihtili@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/ascilik/Pages/akadro.aspx
Aims of Course	To inform about topics such as the definition of environmental pollution, river pollution, lake ecology, air pollution, solid waste evaluation and disposal methods, soil pollution	
Course Learning Outcomes and Competencies	1. Gets basic information about the environment. 2. Solves problems related to environmental pollution. 3. Develops awareness of environmental cleaning. 4. Defines water pollution and analysis. 5. Defines soil pollution and analysis. 6. Has information about pollutants in water, soil and atmosphere. 7. Can evaluate the environmental effects of various pollutant parameters. 8. Has the ability to explain chemical parameters and problems that cause pollution.	
Textbooks and /or Other Required Materials	1. Environmental Chemistry, Turgut Gündüz,Gazi Bookstore Ankara, 2008 2. Internet-lecture notes	
Method of delivery of the course	Face to face/Online	
Teaching Methods and Techniques	Explanation, question-answer, presentation	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester final exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Environmental chemistry and fundamentals of environmental chemistry
2	Water and water pollution
3	Sources of water pollutants and their treatment
4	Soil and soil pollution
5	Sources and types of soil pollutants
6	Components of the atmosphere, Chemical and photochemical reactions in the atmosphere
7	Air pollution
8	Midterm exam
9	Global warming and greenhouse effect
10	Inorganic air pollution
11	Organic air pollution
12	Domestic waste and control
13	Industrial solid waste
14	Noise pollution
15	Final Exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP209 Agricultural Drug and Analyzes				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	2	2	3	2.5	3	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Esra BARIM	**Mail :** esrabarim@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To provide information and experience about the use and importance of pesticides in agriculture, environmental effects of pesticides and precautions to be taken. Also, to provide information about pesticide residue limits and general procedures applied in pesticide residue analyses.	
Course Learning Outcomes and Competencies	1. Understands the importance of drugs in agricultural control. 2. Learns about the use and importance of pesticides in agriculture and makes a classification. 3. Learns about the environmental effects of pesticides and the precautions to be taken. 4. Learns about pesticide residue limits and legal regulations. 5. Learns about general procedures in pesticide residue analysis	
Textbooks and /or Other Required Materials	-PESTİSİT Kalıntı Analizlerinde Kalite Kontrol (QC) ve Kalite Güvencesi (QA), Osman Tiryaki, 2. Baskı, Nobel Akademik Yayıncılık, Ankara, 2017. -Notes prepared by the lecturer	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, presentation, practice, discussion	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Introduction of the course, importance and methods of agricultural control
2	Pesticide use in agriculture and its importance, classification
3	Pesticide mixtures
4	Uses of pesticides
5	Spread of pesticides and precautions to be taken
6	Environmental effects of pesticides and precautions to be taken
7	Pesticide poisoning and first aid
8	Midterm Exam
9	Pesticide residue problem, RASFF, legal legislation on pesticides
10	Pesticide residue limits in the world and Turkey
11	Reliability and accuracy of pesticide residue analysis
12	General procedures for pesticide residue analysis
13	Steps of residue analysis
14	Steps of residue analysis
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP206 Communication				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	2	0	2	2	2	Turkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Esra BARIM	**Mail :** esrabarim@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	The student understands the functioning, importance and necessity of the communication process. He/she learns the types of communication and the obstacles encountered in communication and the ways to overcome these obstacles. He/she also gains effective communication skills.	
Course Learning Outcomes and Competencies	1. The student will be able to explain the basic concepts of communication. 2. The student will be able to classify types of communication. 3. The student will be able to evaluate problems arising from communication and ways to solve them. 4. The student will be able to explain and use new communication technologies and their effects.	
Textbooks and /or Other Required Materials	Effective Communication Strategies, Kemal Çağlar, 8th Edition, Adalet Publishing House, Ankara, 2024 Personal lecture notes,	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, question and answer, discussion, group work, presentation.	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester final exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Definition of the concept of communication,
2	Definition of interaction and communication,
3	Communication process and elements of communication,
4	Stages of successful communication,
5	Impressive communication, Social factors that play a role in communication,
6	The role of culture, behavior and attitudes in communication,
7	Nonverbal communication factors, communication and body language,
8	Midterm Exam,
9	Corporate communication,
10	Structure of communication networks,
11	Interpersonal distance in communication,
12	Communication methods and communication technologies today,
13	Communication barriers Mass media,
14	Human relations (interpersonal communication), Elements of effective communication
15	Final Exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP202 Biomedical Devices				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS Credits**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	2	0	2	2	3	Turkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assist. Prof. Dr. Aygün KILIÇ	**Mail :** aygunkilic@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To acquisition of knowledge on biomedical equipments.	
Course Learning Outcomes and Competencies	1. Students define biomedical equipments. 1.1 Lists of usage fields. 1.2. Students explain the duties and responsibilities of the technicians who operate the relevant equipments. 2. Students describe dangerous current levels and protection methods. 2.1. Students explain the impact of electric current on human tissues. 2.2. Students explaine the residual current tests. 3. Students understand the electrical equipment in hospitals. 3.1. Students describe the basic operating principles of equipments used in hospitals. 4. Students comprehend the working principles of biological equipments.	
Textbooks and /or Other Required Materials	Biomedical Equipment Technologies Field MEGEP Module Books	
Method of delivery of the course	Face to face / Online	
Teaching Methods and Techniques	Explanation, question-answer, presentation, practice,	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)	X	**60**
	Semester final exam		

Semester Course Plan	
Week	**Syllabus**
1	Biomedical equipment, fields of use and the duties and responsibilities of biomedical equipment technicians.
2	Classification of biomedical equipments.
3	Risk and safety in medical equipments.
4	Safe operation in medical equipments.
5	Operational warnings and safety signs in these equipments.
6	Electrical safety and residual current tests in biomedical equipments.
7	Effects of electrical current on the human body.
8	Midterm exam
9	Electrical hospital equipment
10	Basic operational principles of equipments used in hospitals.
11	Basic operational principles of equipments used in hospitals.
12	Basic operational principles of equipments used in hospitals.
13	Basic operational principles of equipments used in hospitals.
14	Basic operational principles of equipments used in hospitals.
15	Final exam/Practice Exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LPT114 Instrumental Analysis				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	2	2	4	3	4	Türkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Nagihan KARAASLAN AYHAN	**Mail :** nkaraaslan@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	To provide information about modern devices used in different fields today and their applications, and to adopt the basic concepts of instrumental methods.	
Course Learning Outcomes and Competencies	1. Learn the basic principles of instrumental chemical analysis. 2. Learn theoretical and practical information about the devices used in chemical analysis and how to use these devices. 3. Learn information about the selection of the appropriate method and device for the determination of components found in various samples.	
Textbooks and /or Other Required Materials	1. Instrumental Analysis Principles, Skoog, Holler, Nieman, Translation editors; Esma Kılıç, Fitnat Köseoğlu, Hamza Yılmaz, Bilim Publishing. 2. Instrumental Analysis Methods, Atilla Yıldız, Ömer Genç and Sema Bektaş, Hacettepe University Publications, 1997.	
Method of delivery of the course	Face to face /Online	
Teaching Methods and Techniques	Explanation, presentation, practice	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester Final Exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Introduction to Instrumental Analysis
2	Instrumental Analysis Techniques and Basic Principles
3	Refractometry, Polarimetry and Their Applications
4	UV-Visible Absorption Spectroscopy and its Applications
5	Atomic Absorption Spectroscopy and Its Applications
6	Atomic Absorption Spectroscopy and Its Applications
7	Atomic Emission Spectroscopy and Its Applications
8	Midterm Exam
9	Infrared (IR) Spectroscopy and Its Applications
10	NMR Spectroscopy and its Applications
11	Mass Spectroscopy and its Applications
12	High Performance Liquid Chromatography and Its Applications
13	Gas Chromatography and Its Applications
14	General reminders, unifying explanations of concepts
15	Final Exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LPT218 Quality Assurance and Standards				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	2	0	2	2	4	Turkish	Compulsory

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Assoc. Prof. Güzin PIHTILI YILDIZ	**Mail :** gpihtili@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	This course aims to provide application competencies of quality management systems.	
Course Learning Outcomes and Competencies	1. Creating the infrastructure of the quality management system 2. Implementing quality standards 3. Recognizing international standards. 4. Being able to carry out standardization-related processes	
Textbooks and /or Other Required Materials	1. Quality Assurance and Standards, N. Kölük, I. Dilsiz, Kartal, 2003 2. Standardization and Quality, Küçük, O., Seçkin Publications, Ankara, 2004	
Method of delivery of the course	Face to face/Online	
Teaching Methods and Techniques	Explanation, question-answer, presentation,	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)		
	Semester final exam	X	**60**

Semester Course Plan	
Week	**Syllabus**
1	Concept of quality
2	Definitions of quality
3	Standard and standardization
4	Benefits of standardization
5	Types of standards in Turkey
6	Standardization and standard preparation studies
7	Standardization and standard preparation documents
8	Midterm Exam
9	Accreditation
10	Explanation of the preliminary preparations of the studies carried out in class
11	International Standardization Studies
12	TSE Certification
13	Accreditation institutions in Turkey
14	International accreditation institutions and their duties
15	Final Exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: GON101 Volunteering Activities				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Fall	1	2	3	2	2	Türkish	Elective

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Prof. Dr. Ragıp ADIGUZEL	**Mail :** radiguzel@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	The aim is to strengthen the ties between the university and the society by using the knowledge, skills and accumulation that the students have acquired throughout their education life, to ensure the development of human, social, cultural and moral values and skills through some volunteering activities that they will participate and carry out, and to increase the visibility and awareness in the society on issues that are highly sensitive to the society such as disabled life, migration and disaster, and thus to ensure that the students take part in volunteer work for a period of time within the scope of a plan to be prepared in advance in a volunteering field of their choice and to share their results	
Course Learning Outcomes and Competencies	1. Learns the concept of volunteering and volunteer management. 2. Recognizes the concept of civil society and non-governmental organizations 3. Recognizes the concept of civil society and non-governmental organizations 4. Gains knowledge and skills about volunteering and volunteer management in non-governmental organizations 5. Learns the basic areas of volunteering 6. Understands the importance of community service practices 7. Can produce projects to find solutions to current problems of society 8. Gains experience in Social Responsibility and Social Entrepreneurship	
Textbooks and /or Other Required Materials	Current reports of international and national organizations Lecture Notes	
Method of delivery of the course	Face to face/Online	
Teaching Methods and Techniques	Explanation, presentation, group work, field work	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)	X	**60**
	Semester Final Exam		

Semester Course Plan	
Week	**Syllabus**
1	Management and Organization Concepts
2	Concept of Volunteering and Volunteer Management
3	Concept of Civil Society and Civil Society Organizations (CSOs)
4	State and Civil Society in Turkey
5	Volunteering in Civil Society Organizations, Volunteer Management
6	Basic areas of volunteering (Afad, Environment, Education, Culture, Sports, Health, Social Services)
7	Basic areas of volunteering (Afad, Environment, Education, Culture, Sports, Health, Social Services)
8	Midterm Exam
9	Importance of community service practices
10	Identifying current problems of society and producing projects to find solutions
11	Identifying current problems of society and producing projects to find solutions
12	Social Responsibility and Social Entrepreneurship
13	Application Examples
14	Evaluation of Produced Projects
15	Final exam

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DESCRIPTION FORM OF COURSE

Course Code and Name: LTP220 Entrepreneurship				**Program: Laboratory Technology**			
Semester	**Theory**	**Prac.**	**Total**	**Credits**	**ECTS**	**Language of Course**	**Course Type Compulsory/Elective**
Spring	2	0	2	2	2	Türkish	Elective

Prerequisites of Course	There are no prerequisites.	
Course Instructor	Prof. Dr. Ragıp ADIGUZEL	**Mail :** radiguzel@munzur.edu.tr **Web :** www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/kimya/Pages/akadro.aspx
Aims of Course	It is the training of entrepreneurial individuals by developing their conceptual and application skills in entrepreneurship and innovation.	
Course Learning Outcomes and Competencies	1.Knows the meaning and importance of entrepreneurship. 2.Develops their entrepreneurship and innovation comprehension skills. 3.Gains skills to evaluate their talents in terms of entrepreneurship by having innovative approaches. 4. Gains the ability to develop creative and innovative approaches to business problems.	
Textbooks and /or Other Required Materials	1. Entrepreneurship, Orhan Küçük, Seçkin Publications, Ankara, 2013. 2. Innovation and Entrepreneurship , P.Drucker, First Harper Ltd, 1985 3. Lecture Notes	
Method of delivery of the course	Face to face/Online	
Teaching Methods and Techniques	Explanation, presentation, group work, Preparing a business plan	

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		If yes, please mark (X)	Percentage (%) Contribution to the Overall Average
Evaluation Criteria	**1. Midterm Exam**	X	**40**
	2. Midterm Exam		
	3. Midterm Exam		
	Oral Exam		
	Practical Exam (Lab, Project etc.)	X	**60**
	Semester Final Exam		

Semester Course Plan	
Week	**Syllabus**
1	Entrepreneurship in practice and general characteristics of entrepreneurs
2	Creativity and innovation concepts and applications
3	Innovation models
4	Innovative business ideas and applications
5	Business Plan scope and content for new ventures
6	Production, Marketing and Financial Planning in Entrepreneurship
7	Strategic planning applications for new ventures
8	Midterm Exam
9	Marketing plan applications for new ventures
10	Production planning applications for new ventures
11	Financial planning for new ventures
12	Intellectual asset management
13	Writing and presentation of business plans
14	Writing and presentation of business plans
15	Final exam