TR
MUNZUR UNIVERSITY
Tunceli Vocational School
Electricity and Energy Program

COURSE DESCRIPTION FORM

Course Code and Name : TTE124.1 (PLC) Programlanabilir Lojik Kontrolör				Program: Elektrik ve Enerji			
Half Year	**Theory**	**Application**	**Total**	**Credits**	**AKTS**	**Course Language**	**Course Type Compulsory / Elective**
Spring Semester	1	2	3	2	5	Turkish	Compulsory

Course Prerequisites	There are no prerequisites.	
Course Instructor	Öğr. Gör. Furkan ESMERAY	**Email :** furkanesmeray@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx
Course Objectives	The aim of the course is to provide students with knowledge and skills in the structure and operating logic of programmable controllers, PLC programming with ladder diagram, interpreting existing programs and interpreting a given problem and developing solutions with PLC programming.	
Course Learning Outcomes and Competencies	1. Describes the basic principles of PLCs, PLC structure and function of parts. 2. Explains the PLC memory structure. 3. Explains the working principle of PLC, PLC programming methods. 4. Makes programming using ladder diagram. 5. Knows the function of basic commands used in programming and uses them in programs. 6. Analyzes the structure of a given electromechanical control system and programs the same system with PLC. 7. Programs the control of a process with PLC.	
Textbooks and/or Other Required Materials	Current reports of international and national organizations Lecture Notes	
Course presentation	Face-to-face, Online	
Teaching Methods and Techniques	Explanation, presentation, group work, field work	

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

Semester Course Plan	
Week	**Curriculum**
1	Introduction to Automation System and PLC
2	Structure and basic features of PLC, memory structure, PLC connection and hardware.
3	PLC Programming Editor, PLC Programming Logic and Examples
4	Set and Reset commands and Edge triggering commands
5	Timers
6	Counters
7	Timer and Counter Probes
8	Midterm Exam
9	Data Comparison Commands
10	Information Transfer Commands
11	Sample Software and Applications for Controlling Motors
12	Mathematical Operation Commands
13	Conversion Commands, Real Time Clock Command
14	Analog Operations
15	Final Exam

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COURSE DESCRIPTION FORM							
Course Code and Name : TTE205.1 Alternatif Akım Devre Analizi				**Program: Elektrik ve Enerji**			
Half Year	**Theory**	**Application**	**Total**	**Credits**	**AKTS**	**Course Language**	**Course Type Compulsory / Elective**
Fall Semester	2	2	4	3	4	Turkish	Compulsory
Course Prerequisites	There are no prerequisites.						
Course Instructor	Öğr. Gör. Furkan ESMERAY		**Email :** furkanesmeray@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx				
Course Objectives	To enable the student to comprehend the basic theorems and concepts related to alternating current circuits and to learn the solution methods of alternating current circuits.						
Course Learning Outcomes and Competencies	1. Explains waveforms, period and frequency concepts in alternating current. 2. Defines active, reactive and apparent power in alternating current. 3. Uses alternating current sources. 4. Makes circuit solutions in alternating current. 5. Makes resonance circuit solutions in alternating current. 6. Calculates power and energy in alternating current circuits. 7. Explains the behavior of different loads in alternating current.						
Textbooks and/or Other Required Materials	Current reports of international and national organizations Lecture Notes						
Course presentation	Face-to-face, Online						
Teaching Methods and Techniques	Explanation, presentation, group work, field work						

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

Semester Course Plan	
Week	**Curriculum**
1	Alternating Current
2	Obtaining Alternating Current
3	Series Circuits
4	Series R-L Circuits
5	Series R-C Circuits
6	Parallel Circuits
7	Parallel R-L Circuits
8	Midterm Exam
9	Parallel R-C Circuits
10	Parallel R-L-C Circuits
11	Resonance
12	Alternating Current Power and Compensation
13	Power and Energy in Single Phase Alternating Current-1
14	Power and Energy in Single Phase Alternating Current-2
15	Final Exam

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COURSE DESCRIPTION FORM

Course Code and Name : TTE105.1 Analog Elektronik				Program: Elektrik ve Enerji			
Half Year	**Theory**	**Application**	**Total**	**Credits**	**AKTS**	**Course Language**	**Course Type Compulsory / Elective**
Spring Semester	1	2	3	2	5	Turkish	Compulsory

Course Prerequisites	There are no prerequisites.	
Course Instructor	Öğr. Gör. Furkan ESMERAY	**Email :** furkanesmeray@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx
Course Objectives	It is aimed to learn the structure, physical working principles and circuit applications of basic semiconductor circuit elements such as diodes and transistors, to provide a basis for the study of advanced topics in analog electronics applications and to improve their electronic circuit analysis and design capabilities.	
Course Learning Outcomes and Competencies	1. Describes the ability to analyze and design simple analog circuits designed with semiconductor circuit elements. 2. Analyzes circuits with diodes. 3. Designs with diode element. 4. Analyze diode rectifier, clipper, clamper and voltage doubler circuits. 5. Explains the principle of BJT operation. Analyzes BJT DC biasing circuits. 6. Recognizes BJT amplifiers. Recognize cascode and cascode multistage amplifiers. 7. Explains the principles of MOSFET operation. 8. Analyze MOSFET DC biasing circuits. 9. Makes Bode amplitude and phase plots. 10. Analyzes the frequency response of BJT and MOSFET amplifiers.	
Textbooks and/or Other Required Materials	Current reports of international and national organizations Lecture Notes	
Course presentation	Face-to-face, Online	
Teaching Methods and Techniques	Explanation, presentation, group work, field work	

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

Semester Course Plan	
Week	**Curriculum**
1	Semiconductor materials: atomic models, silicon crystal structure, doping, electron-hole motion, current flow mechanisms in semiconductors
2	PN junction diodes: physical operation and terminal characteristics, forward and reverse polarization, diode models, DC diode circuits
3	Small signal and large signal ac diode circuits
4	Multiple diode circuits, zener, LED and photodiode
5	Bipolar junction transistors (BJT): physical structure and operating modes
6	DC biasing of BJT circuits
7	BJT small signal modeling
8	Midterm Exam
9	Single stage BJT amplifiers, voltage and current gain and input and output impedances
10	Cascade and cascade multilevel amplifiers
11	Field Effect Transistors (FET): physical structure and operating modes, input and output parameters and characteristics
12	Analysis of DC MOSFET circuits
13	MOSFET amplifiers
14	Frequency response of BJT-MOSFET circuits
15	Final Exam

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DESCRIPTION FORM OF COURSE							
Course Code and Title: TTE103- Computer-Aided Design				**Program: Electricity and Energy**			
Semester	**Theory**	**Practice.**	**Total**	**Credits**	**ECTS**	**Course Language**	**Course Type (Compulsory/Elective)**
Spring Semester	2	2	4	3	5	Turkish	Compulsory
Prerequisites	There are no prerequisites.						
Instructor	Abdullah Bingöl		**Mail : abdullahbingol@munzur.edu.tr** **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx				
Course Objectives	To understand the general structure of software packages used for electrical-electronics circuit design; to be able to perform design and circuit analysis using such programs.						
Learning Outcomes and Competencies	The student, studying in a program focused on electrical-electronics-based education, can carry out design, planning, and project work related to their profession and realize these projects using computer-aided software tools.						
Textbooks and/or Other Required Materials	Textbook, lab manuals, supplementary resources, diagrams, and guides.						
Mode of Delivery	Face to face,online						
Teaching Methods and Techniques	Explanation, question-answer						

		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.)		

	Semester Final Exam	X	**60**

Week	
1	Basic concepts related to DC machines and their structure
2	Operation of a DC machine as a generator
3	Operation of a DC machine as a motor
4	Differences between generator and motor operation in DC machines
5	Voltage and torque calculations in DC machines
6	Series, shunt, and compound-excited DC machines
7	Midterm Exam
8	Armature reaction and commutation, voltage regulation
9	Fundamental behaviors (characteristics) of DC generators
10	Starting, speed control, and braking in DC motors
11	Structure and working principles of single-phase and three-phase transformers
12	No-load, short-circuit, and loaded operation of transformers
13	Equivalent circuit and efficiency of transformers
14	Different connection groups in three-phase transformers
15	Final Exam

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DESCRIPTION FORM OF COURSE							
Course Code and Title: TTE211- Electrical Machines I				**Program: Electricity and Energy**			
Semester	**Theory**	**Practice.**	**Total**	**Credits**	**ECTS**	**Course Language**	**Course Type (Compulsory/Elective)**
Spring Semester	2	1	3	2	3	Turkish	Compulsory
Prerequisites	There are no prerequisites.						
Instructor	Abdullah Bingöl		**Mail : abdullahbingol@munzur.edu.tr** **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx				
Course Objectives	To understand the structure and operating principles of DC machines, comprehend their starting and speed control methods, and be familiar with electrical braking techniques; to grasp the structure and working principle of transformers, perform equivalent circuit and efficiency calculations, and identify different connection groups in three-phase transformers.						
Learning Outcomes and Competencies	Gains the knowledge and skills required to meet industrial needs						
Textbooks and/or Other Required Materials	Textbook, lab manuals, supplementary resources, diagrams, and guides.						
Mode of Delivery	Face to face,online						
Teaching Methods and Techniques	Explanation, question-answer						

		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.)		

	Semester Final Exam	X	**60**

Week	
1	Basic concepts related to DC machines and their structure
2	Operation of DC machines as generators
3	Operation of DC machines as motors
4	Differences between motor and generator operation of DC machines
5	Voltage and torque calculations in DC machines
6	Series, shunt, and compound excitation in DC machines
7	Midterm Exam
8	Armature reaction and commutation, voltage regulation
9	Fundamental characteristics of DC generators
10	Starting, speed control, and braking of DC motors
11	Structure and operating principles of single-phase and three-phase transformers
12	No-load, short-circuit, and loaded operation of transformers
13	Equivalent circuit and efficiency of transformers
14	Different connection groups in three-phase transformers
15	Final Exam

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DESCRIPTION FORM OF COURSE							
Course Code and Title: TTE208- Electrical Machines II				**Program: Electricity and Energy**			
Semester	**Theory**	**Practice.**	**Total**	**Credits**	**ECTS**	**Course Language**	**Course Type (Compulsory/Elective)**
Spring Semester	2	1	3	2	4	Turkish	Compulsory
Prerequisites	There are no prerequisites.						
Instructor	Abdullah Bingöl		**Mail : abdullahbingol@munzur.edu.tr** **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx				
Course Objectives	To improve students' written and oral communication skills in English, enabling them to use appropriate style in both academic and everyday contexts						
Learning Outcomes and Competencies	Learns the characteristics, control techniques, and operating types of asynchronous and synchronous machines. Is able to perform basic applications.						
Textbooks and/or Other Required Materials	Textbook, lab manuals, supplementary resources, diagrams, and guides.						
Mode of Delivery	Face to face,online						
Teaching Methods and Techniques	Explanation, question-answer						

		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.)		

	Semester Final Exam	X	**60**

Week	
1	Structure, characteristics, and operating principle of three-phase asynchronous motors
2	Equivalent circuits of three-phase asynchronous motors
3	Equivalent circuits of three-phase asynchronous motors *(continued)*
4	No-load test, short-circuit test, and loaded operation of three-phase asynchronous motors
5	Starting, speed control, and braking of asynchronous motors
6	Single-phase motors
7	Structure, characteristics, operating methods and principles of synchronous generators and synchronous motors
8	Midterm Exam
9	Phasor diagram for resistive, inductive, and capacitive loads in synchronous generators
10	Parallel operation of synchronous generators
11	Starting methods of synchronous motors
12	Phasor diagram of synchronous motors under inductive, capacitive, and resistive loads
13	Loading of synchronous machines (Active and reactive power control)
14	Loading of synchronous machines (Active and reactive power control)
15	Final Exam

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DESCRIPTION FORM OF COURSE							
Course Code and Title: TTE212 Electrical Installation Plans I				**Program: Electricity and Energy**			
Semester	**Theory**	**Practice.**	**Total**	**Credits**	**ECTS**	**Course Language**	**Course Type (Compulsory/Elective)**
Spring Semester	4	0	4	4	4	Turkish	Compulsory
Prerequisites	There are no prerequisites.						
Instructor	Abdullah Bingöl			**Mail : abdullahbingol@munzur.edu.tr** **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx			
Course Objectives	To conduct feasibility studies for lighting, power, energy transmission and distribution projects; to organize project-related details and to deliver project presentations.						
Learning Outcomes and Competencies	The student is able to design projects related to lighting and power systems as well as energy transmission and distribution.						
Textbooks and/or Other Required Materials	Textbook, lab manuals, supplementary resources, diagrams, and guides.						
Mode of Delivery	Face to face,online						
Teaching Methods and Techniques	Explanation, question-answer						

		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.)		

	Semester Final Exam	X	**60**

Week	
1	Definition and purpose of the project, preparation of specific and technical specifications
2	Determining the quantity and specifications of materials and equipment; preparing the project draft
3	Applying legal procedures and regulations to the project
4	Organizing the project workflow
5	Selection of appropriate equipment and components
6	Planning of lighting, power, energy transmission and distribution projects
7	Midterm Exam
8	Cost analysis of the project and preparation of the project file
9	Executing the procedures required for project approval
10	Finalizing the installation plans and presenting the project
11	Demonstration of written skills
12	Demonstration of graphical skills
13	Demonstration of visual design skills
14	Demonstration of verbal presentation skills
15	Final Exam

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DESCRIPTION FORM OF COURSE							
Course Code and Title: TTE233- Household Appliances				**Program: Electricity and Energy**			
Semester	**Theory**	**Practice.**	**Total**	**Credits**	**ECTS**	**Course Language**	**Course Type (Compulsory/Elective)**
Spring Semester	2	0	2	2	2	Turkish	Compulsory
Prerequisites	There are no prerequisites.						
Instructor	Abdullah Bingöl		**Mail : abdullahbingol@munzur.edu.tr** **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx				
Course Objectives	To introduce students to the structure, working principles, and application areas of household electrical appliances, and to ensure understanding of safety, maintenance, and energy efficiency aspects.						
Learning Outcomes and Competencies	Recognize the basic components and structure of household appliances. Explain their operating principles. Evaluate their application areas and specifications. Understand safety precautions and maintenance needs. Develop awareness of energy efficiency.						
Textbooks and/or Other Required Materials	Textbook, lab manuals, supplementary resources, diagrams, and guides.						
Mode of Delivery	Face to face,online						
Teaching Methods and Techniques	Explanation, question-answer						

		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.)		

	Semester Final Exam	X	**60**

Week	
1	Introduction to household appliances and classification
2	Vacuum cleaners: structure and operation
3	Refrigerators and freezers
4	Washing machines and dishwashers
5	Ovens and microwave ovens
6	Small appliances (iron, blender, coffee maker, etc.)
7	Energy efficiency and labeling systems
8	Midterm Exam
9	Safety and maintenance
10	Malfunctions and basic repair knowledge
11	Electrical connections and circuit components
12	Smart appliances and sensor-based systems
13	Appliance installation and manual interpretation
14	General review and evaluation
15	Final Exam

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DESCRIPTION FORM OF COURSE							
Course Code and Title: TTE202- Digital Electronics				**Program: Electricity and Energy**			
Semester	**Theory**	**Practice.**	**Total**	**Credits**	**ECTS**	**Course Language**	**Course Type (Compulsory/Elective)**
Spring Semester	2	0	2	2	3	Turkish	Compulsory
Prerequisites	There are no prerequisites.						
Instructor	Abdullah Bingöl		**Mail : abdullahbingol@munzur.edu.tr** **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx				
Course Objectives	To understand the basic concepts related to digital electronics, recognize number systems used in digital logic circuits, comprehend the operation of logical circuits, understand Boolean expressions and their relation to digital logic circuits, and comprehend the working principles and applications of combinational circuits.						
Learning Outcomes and Competencies	Learns digital concepts, identifies digital circuit components, and is able to perform basic digital applications.						
Textbooks and/or Other Required Materials	Textbook, lab manuals, supplementary resources, diagrams, and guides.						
Mode of Delivery	Face to face,online						
Teaching Methods and Techniques	Explanation, question-answer						

		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.)		

	Semester Final Exam	X	**60**

Week	
1	Digital concepts
2	Digital concepts (continued)
3	Number systems
4	Number systems (continued)
5	Logic circuits
6	Logic circuits (continued)
7	Boolean expressions
8	Midterm Exam
9	Boolean expressions (continued)
10	Combinational circuits
11	Combinational circuits (continued)
12	Logic families
13	Logic families (continued)
14	Logic families (continued)
15	Final Exam

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DESCRIPTION FORM OF COURSE							
Course Code and Title: TTE205- System Analysis and Design				**Program: Electricity and Energy**			
Semester	**Theory**	**Practice.**	**Total**	**Credits**	**ECTS**	**Course Language**	**Course Type (Compulsory/Elective)**
Spring Semester	2	0	2	2	4	Turkish	Compulsory
Prerequisites	There are no prerequisites.						
Instructor	Abdullah Bingöl		**Mail : abdullahbingol@munzur.edu.tr** **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx				
Course Objectives	To organize the preliminary preparation of the proposed project, to implement the proposed project, and to present the proposed project.						
Learning Outcomes and Competencies	Students carry out all necessary preparations for a project and complete the project.						
Textbooks and/or Other Required Materials	Textbook, lab manuals, supplementary resources, diagrams, and guides.						
Mode of Delivery	Face to face,online						
Teaching Methods and Techniques	Explanation, question-answer						

		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.)		

	Semester Final Exam	X	**60**

Week	
1	Feasibility study
2	Feasibility study (continued)
3	Feasibility study (continued)
4	Feasibility study (continued)
5	Project process
6	Project process (continued)
7	Project process (continued)
8	Project process (continued)
9	Project process (continued)
10	Project process (continued)
11	Project process (continued)
12	Project process (continued)
13	Presentation
14	Presentation (continued)
15	Presentation (continued)

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DESCRIPTION FORM OF COURSE							
Course Code and Title: TTE214-High Voltage Technique – I				**Program: Electricity and Energy**			
Semester	**Theory**	**Practice.**	**Total**	**Credits**	**ECTS**	**Course Language**	**Course Type (Compulsory/Elective)**
Spring Semester	3	0	3	3	4	Turkish	Compulsory
Prerequisites	There are no prerequisites.						
Instructor	Abdullah Bingöl			**Mail : abdullahbingol@munzur.edu.tr** **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx			
Course Objectives	To provide students with knowledge about the concept of high voltage, related equipment, insulation techniques, and testing methods.						
Learning Outcomes and Competencies	Explain the concept and fundamentals of high voltage. Identify equipment used in high-voltage systems. Analyze electric field distribution and insulation requirements. Understand measurement and testing techniques in high voltage. Recognize safety precautions in high-voltage systems.						
Textbooks and/or Other Required Materials	Lecture notes and technical articles IEC and TSE standards High-voltage equipment catalogs and test reports						
Mode of Delivery	Face to face,online						
Teaching Methods and Techniques	Explanation, question-answer						

		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.)		

	Semester Final Exam	X	**60**

Week	
1	Introduction to high-voltage technique
2	Applications and basic definitions in high-voltage systems
3	Electric field, potential distribution, and insulation needs
4	Solid, liquid, and gas insulators
5	Breakdown mechanisms in insulators
6	High-voltage generation methods
7	High-voltage measurement techniques
8	Midterm Exam
9	Impulse voltages and measurement methods
10	Temporary overvoltages and protection methods
11	Lightning protection and grounding systems
12	High-voltage cables and accessories
13	Insulation coordination
14	Test and inspection procedures
15	Final Exam

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COURSE DESCRIPTION FORM

Course Code and Name : TTE102.1 Doğru Akım Devre Analizi				Program: Elektrik ve Enerji			
Half Year	**Theory**	**Application**	**Total**	**Credits**	**AKTS**	**Course Language**	**Course Type Compulsory / Elective**
Spring Semester	2	2	4	3	5	Turkish	Compulsory

Course Prerequisites	There are no prerequisites.	
Course Instructor	Öğr. Gör. Furkan ESMERAY	**Email :** furkanesmeray@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx
Course Objectives	To enable the student to comprehend the basic theorems and concepts related to direct current circuits and to learn the solution methods of direct current circuits.	
Course Learning Outcomes and Competencies	1. Defines static electricity, explains its effects and protection methods. 2. Explains Kirshof's Laws and uses them in circuit solutions. 3. Explains current and voltage sources and solves circuits by source conversion. 4. Solves circuits with Peripheral Currents and Node Point methods. 5. Solves circuits with Thevenin, Norton and Superposition Theorems. 6. Explains energy storage elements and makes circuit solutions with capacitors and coils. 7. Explains Electro Magnetism and Electromagnetic Induction and makes the necessary calculations. 8. Explains transient events in direct current circuits and makes the necessary calculations.	
Textbooks and/or Other Required Materials	Current reports of international and national organizations Lecture Notes	
Course presentation	Face-to-face, Online	
Teaching Methods and Techniques	Explanation, presentation, group work, field work	

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

Semester Course Plan	
Week	**Curriculum**
1	Static Electricity
2	Static Electricity, Taking Precautions Against Unforeseen Effects of Electric Current
3	Taking Precautions Against Unforeseen Effects of Electric Current, Direct Current Circuit Solutions
4	Direct Current Circuit Solutions, Peripheral Currents Method
5	Environmental Flows Method
6	Node Tension Method
7	Source Connections, Thevenin's Theorem
8	Midterm Exam
9	Thevenin's Theorem, Norton's Theorem
10	Super Position Theorem, Maximum Power Theorem
11	Maximum Power Theorem, Direct Current Storage Elements
12	Direct Current Storage Elements
13	Direct Current Storage Elements, Direct Current Power and Energy
14	Power, Energy and Circuit Solutions in Direct Current
15	Final Exam

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COURSE DESCRIPTION FORM

Course Code and Name : TTE207.1 Elektrik Enerjisi Santralleri				Program: Elektrik ve Enerji			
Half Year	**Theory**	**Application**	**Total**	**Credits**	**AKTS**	**Course Language**	**Course Type Compulsory / Elective**
Fall Semester	2	0	2	2	4	Turkish	Compulsory

Course Prerequisites	There are no prerequisites.	
Course Instructor	Öğr. Gör. Furkan ESMERAY	**Email :** furkanesmeray@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx
Course Objectives	Definition of energy, transformation of energy, methods of obtaining electrical energy, determination of energy sources, types of power plants that realize production, understanding of working principles and operating characteristics, explaining the methods of transmission and distribution of electricity.	
Course Learning Outcomes and Competencies	1. Knows the methods of obtaining electrical energy. 2. Knows the functioning of thermal power plants. 3. Knows the functioning of nuclear power plants. 4. Knows the functioning of hydroelectric power plants. 5. Knows the functioning of renewable power plants. 6. Recognizes the resources used in electrical energy. 7. Recognizes our power plants that produce electrical energy in our country and comprehends the structure of our national electricity system.	
Textbooks and/or Other Required Materials	Current reports of international and national organizations Lecture Notes	
Course presentation	Face-to-face, Online	
Teaching Methods and Techniques	Explanation, presentation, group work, field work	

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

Semester Course Plan	
Week	**Curriculum**
1	Energy types and methods of obtaining electrical energy
2	Brief history of energy production and energy production in Turkey. Our country's installed capacity, annual production and consumption values, statistical information on the sources from which energy is obtained
3	Some basic concepts on electrical energy; efficiency, establishment and marginal cost comparisons, reliability, environmental impacts, learning the concepts of nationality
4	Electricity economics, load curves, electricity unit cost calculation, power plant cost comparisons, operating times of the energy produced and costs to the network
5	Sources used in electrical energy production ; solid, liquid and gas sources
6	Thermal power plants
7	Hydroelectric power plants (HEPP)
8	Midterm Exam
9	Gas turbine and combined cycle power plants, natural gas power plants
10	Geothermal Power Plants
11	Nuclear Power Plants
12	Wind and Solar Power Plants
13	Electric power generation from seas and garbage
14	To know the failures in power plants, to select and install protection roles
15	Final Exam

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COURSE DESCRIPTION FORM							
Course Code and Name : TTE123.1 Elektrik ve Elektronik Ölçmeleri				**Program: Elektrik ve Enerji**			
Half Year	**Theory**	**Application**	**Total**	**Credits**	**AKTS**	**Course Language**	**Course Type Compulsory / Elective**
Fall Semester	2	2	4	3	5	Turkish	Compulsory
Course Prerequisites	There are no prerequisites.						
Course Instructor	Öğr. Gör. Furkan ESMERAY	**Email :** furkanesmeray@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx					
Course Objectives	To be able to make physical and electrical measurements. To learn the use and connection of electrical measuring instruments.						
Course Learning Outcomes and Competencies	1. Learns the importance of measurement, measurement errors, physical and electrical quantities and units. 2. Uses electrical measuring instruments. 3. Measures current, voltage, resistance, power, frequency, frequency, work, etc. with electrical measuring instruments. 4. Makes the connection of measurement transformers. 5. Takes the necessary occupational safety precautions when using electrical measuring instruments and connecting them to the circuit.						
Textbooks and/or Other Required Materials	Current reports of international and national organizations Lecture Notes						
Course presentation	Face-to-face, Online						
Teaching Methods and Techniques	Explanation, presentation, group work, field work						

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

Semester Course Plan	
Week	**Curriculum**
1	Importance of measurement, measurement errors, Physical quantities and units.
2	Physical quantities; Length, weight, area, volume, fluid, temperature, speed, revolution, cross-section, diameter, light, sound, pressure, etc. units and measurements.
3	Electrical quantities; units, electrical measurements and electrical measuring instruments.
4	Measurement of current, voltage and resistance.
5	Measurement of current, voltage and resistance with multimeters.
6	Control of electronic circuit elements with multimeters.
7	Frequency, power coefficient measurement.
8	Midterm Exam
9	Power measurement.
10	Measurement Transformer.
11	RLC Measurements.
12	Three phase power measurement.
13	Measuring electrical work, electricity meters.
14	Use of oscilloscope.
15	Final Exam

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COURSE DESCRIPTION FORM

Course Code and Name : TTE216.1 Elektromekanik Kumanda Sistemleri				Program: Elektrik ve Enerji			
Half Year	**Theory**	**Application**	**Total**	**Credits**	**AKTS**	**Course Language**	**Course Type Compulsory / Elective**
Fall Semester	2	0	2	2	3	Turkish	Compulsory

Course Prerequisites	There are no prerequisites.	
Course Instructor	Öğr. Gör. Furkan ESMERAY	**Email :** furkanesmeray@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx
Course Objectives	To be able to recognize control circuit elements and their working principles. To be able to learn starting, reversing direction, low voltage starting circuits in motors by using control circuit elements and to be able to make operational control with electric motors.	
Course Learning Outcomes and Competencies	1. To be able to understand the working principles and basic components of electromechanical systems. 2.To be able to define different types of electromechanical control systems and compare their properties. 3.To be able to understand the properties and functions of the elements used in electromechanical control systems. 4.To be able to design and analyze control circuits used in electromechanical control systems. 5. To be able to select and apply the sensors required for electromechanical control systems. 6. To be able to design and analyze the driver circuits used in electromechanical control systems. 7. To be able to understand the properties and working principles of mechanical elements used in electromechanical control systems. 8. To be able to select and apply power supplies used in electromechanical control systems. 9.To be able to acquire basic programming skills for electromechanical control systems. 10.To be able to identify problems related to electromechanical control systems and develop strategies for solution.	
Textbooks and/or Other Required Materials	Current reports of international and national organizations Lecture Notes	
Course presentation	Face-to-face, Online	
Teaching Methods and Techniques	Explanation, presentation, group work, field work	

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

Semester Course Plan	
Week	**Curriculum**
1	Control Elements
2	Protection Relays
3	Introduction of IEC standards and symbols
4	Intermittent and Continuous Operation of Three Phase Induction Motors Starting Three Phase Induction Motors from Two Different Places (Remote)
5	Changing the Direction of Rotation in Three Phase Induction Motors
6	Starting Three Phase Induction Motors with Resistance
7	Starting Rotor Winding Induction Motors
8	Midterm Exam
9	Starting Three Phase Induction Motors with Reactance and Auto Transformer
10	Star-delta Starting of Three Phase Induction Motors
11	Braking in Three Phase Induction Motors
12	Control of double speed motors
13	One Phase Induction Motor Control Circuits
14	Changing the Direction of Speed in One Phase Induction Motors. Starting, reversing and braking direct current motors
15	Final Exam

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COURSE DESCRIPTION FORM							
Course Code and Name : TTE124.1 Elektronik Devre Tasarımı				**Program: Elektrik ve Enerji**			
Half Year	**Theory**	**Application**	**Total**	**Credits**	**AKTS**	**Course Language**	**Course Type Compulsory / Elective**
Spring Semester	1	2	3	2	4	Turkish	Compulsory
Course Prerequisites	There are no prerequisites.						
Course Instructor	Öğr. Gör. Furkan ESMERAY		**Email :** furkanesmeray@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx				
Course Objectives	To gain the ability to create circuits by introducing basic electronic circuits and soldering instruments.						
Course Learning Outcomes and Competencies	1. Student knows basic electronic materials. 2. The student recognizes circuit diagrams and symbols. 3. Students can use electronic circuit assembly equipment. 4. Students can solder applications. 5. Students learn to use Proteus circuit program and can draw. 6. Learns to use Multisim, Circuitmaker circuit programs and can draw. 7. Learns to make circuit design. 8. Can make printed circuit applications.						
Textbooks and/or Other Required Materials	Current reports of international and national organizations Lecture Notes						
Course presentation	Face-to-face, Online						
Teaching Methods and Techniques	Explanation, presentation, group work, field work						

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

Semester Course Plan	
Week	**Curriculum**
1	Basic electronic materials
2	Circuit diagrams and symbols
3	Electronic circuit assembly equipment
4	Introduction to soldering
5	Solder applications: Cable Joining
6	Solder Applications: Component Assembly
7	Introduction to circuit design, Multisim, Circuitmaker, Proteus programs.
8	Midterm Exam
9	Circuit drawing with Multisim, Circuitmaker, Proteus programs.
10	Assembly applications:Basic Circuits
11	Printed circuit design
12	Printed circuit applications
13	Printed circuit and solder applications:PCB preparation
14	Printed circuit and solder applications:Component assembly
15	Final Exam

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COURSE DESCRIPTION FORM							
Course Code and Name : TTE222.1 Güç Elektroniği				**Program: Elektrik ve Enerji**			
Half Year	**Theory**	**Application**	**Total**	**Credits**	**AKTS**	**Course Language**	**Course Type Compulsory / Elective**
Fall Semester	3	0	3	3	3	Turkish	Compulsory
Course Prerequisites	There are no prerequisites.						
Course Instructor	Öğr. Gör. Furkan ESMERAY		**Email :** furkanesmeray@munzur.edu.tr **Web :** https://www.munzur.edu.tr/birimler/akademik/myo/tmyo/bolumler/enerji/Pages/akadro.aspx				
Course Objectives	In this course, it is aimed to enable students to comprehend the basic concepts of power electronics and power semiconductors, to understand the operation and usage of rectification circuits, chopper circuits, inverter circuits, frequency inverter circuits.						
Course Learning Outcomes and Competencies	1. Explains the basic concepts of power electronics. 2.Explains the application areas of power electronics. 3.Explains the principles of operation of semiconductor power switches. 4.Establishes trigger circuits of semiconductor power switches. 5. Performs robustness test of semiconductor power switches. 6. Compare the characteristics of MOSFET and IGBT. 7. Explains the operating characteristics and functioning of rectification circuits. 8. Makes the installation of rectifier circuits. 9.Explains the operating characteristics and operation of DC-DC converter circuits. 10.Analyzes and installs DC-DC converter circuits. 11. Explains the operating characteristics and functioning of frequency converters. 12. Explains the methods of protection of semiconductor elements and circuits at a basic level.						
Textbooks and/or Other Required Materials	Current reports of international and national organizations Lecture Notes						
Course presentation	Face-to-face, Online						
Teaching Methods and Techniques	Explanation, presentation, group work, field work						

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

Semester Course Plan	
Week	**Curriculum**
1	Scope of power electronics and industrial applications.
2	Semiconductor power elements (Diode, SCR) and Applications.
3	Semiconductor power elements (BJT, IGFET and MOSFET) and Applications.
4	Semiconductor power elements (GTO, MCT and IGBT etc.) and Applications, comparison of semiconductor power elements.
5	AC-DC Converters (Rectifiers) and industrial applications.
6	AC-DC Converters (Rectifiers), industrial applications and calculations for design.
7	General Characteristics of AC-AC Converters, Classification, Basic characteristics of AC choppers, Single Phase AC Chopper Circuits.
8	Midterm Exam
9	3 Phase AC Choppers, Calculations for AC-AC Converter design.
10	General Characteristics and Classification of DC-DC Converters
11	Control Methods in DC-DC Converters
12	Single Zone Basic DC Choppers, Two Zone DC Choppers
13	General Characteristics and Classification of DC-AC Converters
14	Single Phase Square Wave Inverters, Gapped Square Wave Inverters, Sinusoidal PWM Inverters, Three Phase Square Wave Inverters
15	Final Exam