

Munzur University International Relations Office 2018-2019 Academic Year List of Courses  
Department of Electric and Electronics Engineering

Code/Credits	Course	Semester Winter/ Spring	Contents	Contact Details of Lecturer	Department (ISCED Code:0713)
EEM-101/ 2	Introduction to Electric and Electronics Engineering	I / Winter	Electrical-Electronic Engineering and other engineering areas, Engineering profession and etiquette rules, Specialist areas of Electrical-Electronic Engineer, Engineering instruments of Electrical-Electronic Engineer, Expectation of state sector from Electrical-Electronic Engineer. Expectation of private sector from Electrical-Electronic Engineer. Techniques for solving engineering problems, Teare and Ver Plank approach. Polya approach, Situation studying on real engineering problem, A simple application of engineering design problem, Team working. Concurrent engineering, Other design factors (Security, environment, esthetic, test and design for productivity), Engineering communication, Academic life ability and engineering carrier.	Name-Surname: Asst. Prof. Bilgin Zengin  E-mail: bilginzengin@munzur.edu.tr  Tel: +90 428 213 17 94- 2431	Electric and Electronics Engineering
EEM-103/ 5	Fundamentals of Electric and Electronics Engineering-1	I / Winter	Unit systems. Definition of electricity. Conductors and insulators. Effects of electric current. Current, voltage and resistance's definitions. Equivalent resistance calculation. Definition of DC. Kirchhoff Laws. Effect of heat on resistance. Introduction to basic measurement principles and measurement tools. Measure resistance with Wheatstone bridge. Electrical work and power. Conversion of electric energy to heat. Line voltage drop and energy loss. Equivalent circuit of the voltage source, serial and parallel connection. Maximum power theorem. Thevenin and Norton theorems. Superposition theorem. Capacitor, serial and parallel connections. The behavior of the capacitor at D.C. Magnetic circuits. Inductance, serial and parallel connections. The behavior of inductance in DA. Chemical effect of current, battery and accumulator.	Name-Surname: Asst. Prof. Zeki Omaç  E-mail: zomac@munzur.edu.tr  Tel: +90 428 213 17 94- 2475	Electric and Electronics Engineering

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TBF-101/ 6	Pyhsics-1	I / Winter	Physics and Measurement. Scalar and Vector Quantities. Motion in One Dimension. Motion in two and three dimensions. Newton's Laws of Motion. Application of Newton's Laws of Motion. Work and Kinetic Energy. Potential Energy and Conservation of Energy. Thrust, Linear Momentum and Collisions. Rotation of a Rigid Object. Rolling motion and angular momentum. Static and Balance. Vibration Motion. Law of mass-attraction.	Name-Surname: Asst. Prof. Bilgin Zengin E-mail: bilginzengin@munzur.edu.tr Tel: +90 428 213 17 94- 2431	Electric and Electronics Engineering
TBM-101/ 6	Mathematics-1	I / Winter	Clusters, Numbers, Second Order Equations and Inequalities. Analytical Investigation of Line and Circle. Function Concept, Specially Defined Functions. Trigonometric Functions. Exponential, Logarithmic and Hyperbolic Functions. Limit and Continuity. The Concept of Derivative, General Rules of Derivative. Derivative of Inverse Functions and Trigonometric Functions. Derivative of Logarithmic, Exponential and Hyperbolic Functions. Higher Order Derivatives, Geometric Meaning of Derivatives. Maximum-Minimum Problems, Uncertain Shapes. Curve drawings.	Name-Surname: Assoc. Prof. H. Mehmet Başkonuş E-mail: hmbaskonus@munzur.edu.tr Tel: +90 428 213 17 94- 2476	Computer Engineering
EEM-105/ 7	Algorithm and Programming	I / Winter	Introduction to programming. Algorithms and flow charts. Structure and properties of C language. C language defined variables, operators, process priorities. Basic input / output functions. Condition statements (if, if-else, switch-case) and sample programs. Condition statements (if, if-else, switch-case) and sample programs. Loops (for, while, do-while) break, continue, goto statements. Series. Matrix operations. Character arrays (strings).	Name-Surname: Asst. Prof. Ali Aşkın E-mail: aliaskin@munzur.edu.tr Tel: +90 428 213 17 94- 2428	Mechatronics Engineering
YDI-101/ 2	Foreign Language-1	I / Winter	Introduction to the course. Verb to be /countries & Nationalities. Possessive adjectives & Personal information. a/an, plurals, this / that /these / those & Classroom language. Present simple tense, regular/irregular plurals & Writing practice. a/an + jobs, possessive 's' & Family -Writing HMW1 Deadline. Adjectives, quite/ very. Telling the time, present simple	Name-Surname: Asst. Prof. Sema Kayapınar Kaya E-mail: semakayapinar@munzur.edu.tr	Industrial engineering

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			& Daily routine. Adverbs of frequency & Time words and expressions. Prepositions of time & The date. Can/can't & Verb phrases. Object pronouns: me, you, him, etc. & Love story phrases.	Tel: +90 428 213 17 94- 1801	
TRD-101/ 2	Turkish Language-1	I / Winter	Definition and function of language. Relationship between language and culture, Birth of Languages. Written Language and Speech Language. Languages on Earth. Age and Historical Development of Turkish Language. Dialects of Turkish Language and Dialect, accent, sub-dialect. Historical periods and features of Turkish Language. Formation and Development of Turkish Dialects. Current Status and Spreading Areas of Turkish Language. Turkish alphabets. Paper Layout and Paragraph Information. Methods of Expression and Ways to Improve Thought. Composition Information and Application.	Name-Surname: Lecturer Cemile Şen E-mail: cemilesen@munzur.edu.tr Tel: +90 428 213 17 94- 2147	Faculty of Letters
FIZ-105/ 2	Pyhsics Laboratory-1 (only for old students)	I / Winter	Introduction; Basic Laboratory Principles. Basic Dimensions, Unit Systems, Physical Measurements and Errors. Introduction of Laboratory Devices. Free Fall Test. Simple Pendulum. Friction Coefficient. Angular velocity and angular momentum. Smooth Linear and Accelerated Motion. Newton's II. Movement Law. Conservation of energy. Flexible collision. Totally inelastic collision.	Name-Surname: Asst. Prof. Bilgin Zengin E-mail: bilginzengin@munzur.edu.tr Tel: +90 428 213 17 94- 2431	Electric and Electronics Engineering
KIM-109/ 2	Chemistry Laboratory-1 (only for old students)	I / Winter	Discussion of general topics before the laboratory. Preparation of solutions. Recognition of substances with the help of properties. Determination of density in solids, liquids and gases. Specific rates law. Electrolysis. Separation and purification methods. Determination of melting and boiling points of pure substances. Acid-base titrations. Diffusion of gases.	Name-Surname: Asst. Prof. G. Önder Ergüven E-mail: goerguven@munzur.edu.tr Tel: +90 428 213 17 94- 2451	Enviromental Engineering
ENF-101/ 2	Usage of Basic Information Technologies (only for old students)	I / Winter	Computer Definition, History, Basic features, Hardware and Software concepts. Introduction to Windows XP, File directory concept, Window properties, Create new folder, Cut-Copy-Paste, Turn off computer. Windows -	Name-Surname: Asst. Prof. Hilal Arslanoğlu Işık E-mail: hilalarslanoglu@munzur.edu.tr	Civil Engineering

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	<i>students)</i>		My Computer, Recycle Bin, Create Shortcut, Open With. Desktop features, Taskbar, Dialog boxes, Form elements, Start menu, Accessories. Basic Internet services, Internet browsers and settings, Search engines, E-mail usage, Network types and usage. MS Word-; MS Word screen, Toolbars and properties, Save, Security options, Page Setup, Writing in Word, Font features, Format painter, Find-Change-Go, Add thumbnail and image, Using the image toolbar. Paragraph properties, Tabs, Border and Shading, Columns, Bullets and numbering, Add a table and add a Table object to the Table toolbar, Templates. Add a table and add a Table object to the Table toolbar, Templates. MS Excel-Introduction to Excel, Page and Cell Concept, Cursor Types, Page Tabs, Cut-Copy-Paste, Row and Column Operations. Meet with toolbars, Work with files, Navigate the worksheet. Operators, Formula creation. Formatting Cells, Creating Drawing Objects, Charts. MS Powerpoint-create slideshows, slide layout, slide design, custom animation, add sound and launch slide.	Tel: +90 428 213 17 94- 2425	
EEM-102/ 5	Fundamentals of Electric and Electronics Engineering-2	II / Spring	Why is alternative current (AC) and production of AC. The sizes that define our AC network. Rectification of AC. Average and effective value. The concept of phasor. AC behaviours of RLC elements. AC circuits solution by graphically and trigonometric methods. AC circuits solution by phasor diagrams. AC behaviours of the circuit comprising the RLC elements. Circuit solution by complex number. Serial and parallel resonance circuits. Power and power compensation in AC circuits. Circuit solution by power triangle method. Three-phase system and load. Power in three phase systems.	Name-Surname: Asst. Prof. Zeki Omac E-mail: zomac@munzur.edu.tr Tel: +90 428 213 17 94- 2475	Electric and Electronics Engineering
TBK-101/ 4	General Chemistry	II / Spring	Basic laws in chemistry. Calculations based on chemical reactions.Reinforcement of stoichiometry. Stoichiometric equations of chemical reactions. Structure of atom, Electron, proton and neutron discoveries. Question	Name-Surname: Assoc. Prof. Muharrem İnce E-mail: muharremince@munzur.edu.tr	Chemical Engineering

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			solutions for topics. Information about the introduction and development of the period. Quantum numbers, Periodic properties. Chemical bonding, bond types. Lewis formulas, resonance and formal load. Bond theories and hybridization. Question solutions for topics. Gases and gas laws.	Tel: +90 428 213 17 94- 2404	
TBF-102/ 6	Pyhsics-2	II / Spring	Load and matter concepts. Electric field. Gauss's law. Electrical potential. Capacitors and Dielectric. Current and resistance. Direct current circuits. Magnetic field. Sources of magnetic field. Ampere's law. Faraday's law of induction. Self-induction and RL circuits. Alternating currents. Maxwell equations, electromagnetic waves.	Name-Surname: Asst. Prof. Bilgin Zengin E-mail: bilginzengin@munzur.edu.tr Tel: +90 428 213 17 94- 2431	Electric and Electronics Engineering
TBM-102/ 6	Mathematics-2	II / Spring	Indefinite Integral Concept, Integration Rules and Methods. Variable Replacement and Partial Integration Methods. Simple Fracture Separation Method. Trigonometric Integrals. Irrational Integrals. The concept of definite integral, fundamental theorem of integral calculus. Mean value theorem, Derivative of integrals. Applications of integral and volume calculation. Calculation of Curve Length, Area of Rotational Surfaces. Finding Moment and Center of Gravity. Generalized integrals. Arrays and series. Coordinate systems.	Name-Surname: Asst. Prof. İnan Ünal E-mail: inanunal@munzur.edu.tr Tel: +90 428 213 17 94- 2476	Computer Engineering
TBM-104/ 5	Linear Algebra	II / Spring	Vectors, Space Vectors (Vector, length and dot products, planes). Matrix Algebra. Linear Equation Systems. Determinants. Vector Spaces (Vector spaces and subspaces, Zero space, row, column and left zero space, Rank, solution of $AX=B$ , Linear independence, base and dimension). Vector Spaces. Diagonalization: eigenvalues and eigenvectors (eigenvalues and special vectors, diagonalization of matrices, eigenvalue calculation). Diagonalization: eigenvalues and eigenvectors. Inner product spaces, orthogonality. Application to differential equations, symmetrical,	Name-Surname: Prof.Dr. Muzaffer Aşkın E-mail: muzafferaskin@munzur.edu.tr Tel: +90 428 213 17 94- 2515	Electric and Electronics Engineering

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			positive and similar matrices. Complex vectors and matrices, Hermitian and unitary matrices, Applications.		
YDI-102/ 2	Foreign Language-2	II / Spring	have to, should, must. Exchanging Information. Past Perfect. Passives. Perfect Cont. If clauses. Daily expressions. Wish clauses. Reading, Listening, Writing Activities.	Name-Surname: Lecturer H. Şahin Yıldırım E-mail: <a href="mailto:hsyildirim@munzur.edu.tr">hsyildirim@munzur.edu.tr</a> Tel: +90 428 213 17 94- 2184	Department of Foreign Language
TRD-102/ 2	Turkish Language-2	II / Spring	Writing Rules. Punctuation Marks. Petition. Curriculum Vitae. Verbal Lecture Types. Word Types. Annex and Word Structure. Writing Applications. Reading Applications.	Name-Surname: Lecturer Cemile Şen E-mail: <a href="mailto:cemilesen@munzur.edu.tr">cemilesen@munzur.edu.tr</a> Tel: +90 428 213 17 94- 2147	Faculty of Letters
FIZ-106/ 2	Pyhsics Laboratory-2 ( <i>only for old students</i> )	II / Spring	Introduction; Basic Laboratory Principles. Basic Dimensions, Unit Systems, Physical Measurements and Errors. Introduction of Laboratory Device. Determination of Resistance Values, Series and Parallel Connection of Resistors. Ohm's Law. Power and Load Matching by Resistance. Kirchhoff's Law. Voltage Divider Circuit and Wheatstone Bridge. Energy Stored in Capacitor. Magnetic Field of Wire Ring-I. Magnetic Field of Wire Ring-II. Magnetic Field of a Coil.	Name-Surname: Asst. Prof. Bilgin Zengin E-mail: <a href="mailto:bilginzengin@munzur.edu.tr">bilginzengin@munzur.edu.tr</a> Tel: +90 428 213 17 94- 2431	Electric and Electronics Engineering
AİT-201/ 2	Principles of Atatürk and Revolution History -1	III / Winter	Main concepts and Ottoman – Turkish modernization. Developments in European history, and their impact on the Ottoman Empire. 19th century reform movements in the Ottoman Empire (Tanzimat period, the First Constitutional Period). The second constitutional era, trends and movements in Turkish political thought, the Turco-İtalian war (1911) the Balkan wars (1912-1913). World War I and the Ottoman Empire (outbreak of the war, participation of the Ottoman Empire, the fronts, and the end of the war), the signing of the Mondros Armistice. Invasions and reactions against them, Kuva-	Name-Surname: Lecturer Tahsin Hazırbulan E-mail: <a href="mailto:tahsinhazirbulan@munzur.edu.tr">tahsinhazirbulan@munzur.edu.tr</a> Tel: +90 428 213 17 94-	

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			<p>yı Milliye, Societies (national, associations hostile to the national presence, and societies of the minorities), the difficulties after the armistice, Mustafa Kemal Pasha's activities and arrival in Anatolia. The mudros armistice; the Turkish national struggle: preparations &amp; organization. The beginnings of the national struggle through organization of Congresses (Amasya Circular, Erzurum, Sivas and Western Anatolian Congresses,). Amasya interview, the arrival of the Representatives in Ankara, the last Ottoman Parliament, the adoption of the National Pact, the invasion of Istanbul. The opening of the Grand National Assembly of Turkey, the Assembly's structure, its activities and laws, domestic and foreign reactions to the opening of Parliament. Dissolution of the national forces, and founding of the regular army, the Greek general attack, and wars in the Western Front. Mustafa Kemal Pasha's supreme military command, Tekâlif-i Milliye orders, Sakarya War and foreign policy developments in its aftermath (Turkish-Russian, Turkish-Afghan relations, the London Conference, Ankara Agreement). The Great Offensive, and signing of the Mudanya Armistice, the developments before the Lausanne Conference, the conference and the signing of the peace agreement.</p>		
TBM-204/ 4	Differentiaal Equations	III / Winter	<p>Infinite series, properties and types. Convergence and convergence tests in infinite series. Power series, Taylor and Mac Louri expansions. Fourier series. Definition and properties of Bessel, Gamma and Beta Special Functions. Complex Functions and Conformal (Angle Preserving) Mapping. Complex Integrals and Residue Theorem. First order ordinary differential equations and their applications. Applications of second order differential equations with constant coefficients. Higher order linear differential equations and their applications. Solution of linear differential equations in terms of</p>	<p>Name-Surname: Prof.Dr. Muzaffer Aşkın</p> <p>E-mail: muzafferaskin@munzur.edu.tr</p> <p>Tel: +90 428 213 17 94- 2515</p>	Electric and Electronics Engineering

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			power series. Laplace transform and its properties. Inverse Laplace transformation and some applications. Partial differential equations and applications.		
EEM-255/ 6	Electromagnetic Fields	III / Winter	Electric field, electric flux density and electrical force concepts, Coulomb's and Gauss' Laws. Electric charge conservation law, conductivity. Electric flux density, polarisation. Electrical sensitivity and permeability concepts. Dielectrics, continuity conditions and storing energy at interval surfaces. Potential energy of a charge distribution. Capacity calculation. Magnetic flux density and vector potential, Biot-Savart's Law. Amper's Law. Magnetic materials, magnetization. Magnetic field intensity, magnetic sensitivity and permeability. Magnetic force and current on electric charges. Magnetic force between two closed circuit. Lorentz force and Hall effect. Movement of charged particles in magnetic field. Faraday's induction law, Lenz's law, electromotor force induced in a circuit. Laplace and Poisson equations.	Name-Surname: Asst. Prof. Bilgin Zengin E-mail: bilginzengin@munzur.edu.tr Tel: +90 428 213 17 94- 2431	Electric and Electronics Engineering
EEM-257/ 6	Circuit Theory	III / Winter	Introduction, two and four-ended passive circuit elements. Properties of linear two terminals. Circuit graph. Basic mesh, basic cut-set formulations and graph matrices. Active circuits elements and source functions, non-periodic and periodic functions. Circuit solution with mesh formulation. Circuit solution with node formulation. Sinusoidal Steady-state. Phasors and phasor actions. Mesh and node formulations in sinusoidal steady-state case and m-parameter case. Power and average power in sinusoidal steady-state case. Impedance and admittance account. Circuit theorems in sinusoidal steady-state. Three-phase systems and symmetrical components.	Name-Surname: Asst. Prof. Zeki Omaç E-mail: zomac@munzur.edu.tr Tel: +90 428 213 17 94- 2475	Electric and Electronics Engineering
EEM-205/ 2	Electrical Circuits Lab.	III / Winter	Explanation of the explanations and rules about the experiments. Experiment 1: Introduction of basic circuit elements to be used in laboratories. Experiment 2:Serial-	Name-Surname: Asst. Prof. Zeki Omaç	Electric and Electronics Engineering



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			Parallel Connected Circuits, Kirchhoff Flow and Voltage Laws, Wheatstone Bridge, Superposition, Thevenin, Norton Theorems and Maximum Power Theorem. Experiment 3: Rectifiers and Filters, DC Current, RL Circuit and Transient Events. Experiment 4: Basic measurements: Resistance measurement, DC current and voltage measurement, AC current and voltage measurement, RC, RL, RLC Alternating Current Circuits, Series and Parallel Resonance circuits. Experiment 5: Lenz and Faraday's Laws, Ampere's Law, Fleming's Rule, Self-induction, Mutual Induction and Magnetic Flux Detection. Experiment 6: Measurement of power multiplier and compensation in alternating current circuits, examination of LC filter, examination of transformer.	E-mail: zomac@munzur.edu.tr Tel: +90 428 213 17 94- 2475	
EEM-261/ 2	Entrepreneurship	III / Winter	What is entrepreneurship? Description of the business, How is the business managed? Plans to be prepared by enterprises, entrepreneurs in the development of humanity. What entrepreneurial features should you consider yourself an entrepreneur? The aims of the entrepreneur, what are your goals as an entrepreneur? The aims of the entrepreneur, what are your goals as an entrepreneur? The basic stages of business building process. Investment decision and feasibility studies. Planning, basic business information, fixed variable cost definition. Plan types. E commerce and entrepreneurship. Cash flow method. Financial planning. Introduction to business plan.	Name-Surname: Assoc. Prof. Bilgin Şenel E-mail: bilginsenal@munzur.edu.tr Tel: +90 428 213 17 94- 2494	Industrial Engineering
EEM-203/ 6	Computer Aided Technic Design	III / Winter	Introduction to computer aided drawing. Introduction of CAD drawing program. Two-dimensional basic drawing commands. Layers, Two-dimensional drawings. Projection methods. Appearance pictures. View drawings in CAD program. Sizing. Section views. Perspective pictures. Isometric perspective drawing in CAD program. Surface marks. Tolerances.	Name-Surname: Lecturer Ali Kemal Aslan E-mail: akaslan@munzur.edu.tr Tel: +90 428 213 17 94- 2137	Tunceli Vocational School Electrical and Energy Department

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EEM-223/ 2	Measurement	III / Winter	Basic measurement principles. Measurement errors and combining these errors. Digital measurement instruments, structures and working principles. Static characteristics. Analog measurement instruments, structure, working principles, equations and solutions. Ammeter, ammeter loading effect. Voltmeter, voltmeter loading effect. Oscilloscope structure, use and types. Evaluation of signals in oscilloscope. Measurement of electrical quantities. Measurements by equalization method. Measuring electrical magnitude with bridges. Measurement of circuit elements by different methods. Electrical measurement of non-electrical quantities.	Name-Surname: Asst. Prof. Düzgün Akmaz E-mail: dakmaz@munzur.edu.tr Tel: +90 428 213 17 94- 2520	Electric and Electronics Engineering
SOS248/ 2 <b>Social Elective</b>	Verbal Expression (only for old students)	III / Winter	The concept of language and general information about the birth of languages. Functions of Language, Elements of Communication, Speech Language and Writing Language. The Relationship of Language with Thought, Communication and Culture Concepts. Basic Characteristics and Differences of Written and Oral Expression. Writing Principles, Paragraph Information and Writing Plan. Paper Layout and Writing Studies. Topic, Theme, Main Idea, Point of View. Expression techniques and ways to improve thought. Types of Written Expressions. General Information about Oral Expression. Emphasis, Intonation and Diction. Types of Oral Expression and Sample Text Analysis. Oral Communication Applications.	Name-Surname: Lecturer Cemile Şen E-mail: cemilesen@munzur.edu.tr Tel: +90 42 213 17 94- 2108	Faculty of Letters
AIT-202/ 2	Principles of Atatürk and Revolution History-2	IV / Spring	Factors as the basis and motives of political modernization: the abolition of the dynasty, The establishment of the Republic, the abolition of the Caliphate. Debates concerning the Dynasty-Caliphate and Republic on the eve of the new state. The foundation of the Progressive Republican Party, Sheikh Said Rebellion, declaration of the tranquility law and the attempted assassination of Atatürk. The foundation of the Free Republican Party, The rally of Izmir, closing	Name-Surname: Lecturer Tahsin Hazırbulan E-mail: tahsinhazirbulan@munzur.edu.tr Tel: +90 428 213 17 94-	

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			the party, Menemen and Bursa events. The Constitution of 1924, other constitutions, the developments in the area of law, reforms regarding the regulation of social life and the process of secularization of the Republic of Turkey. Reforms related to education and Culture (the Unification of the Education, introduction of the Latin letters, National Schools, establishment of Turkish history and Turkish Language Institutions and their activities, Turkish history thesis, the sun-language theory, 1933 university reform (the People's Houses). Healthcare developments. İzmir Economic Congress, economic policies in the first years of the Republic, the World Economic Depression in 1929 and its reflection on the statist economic policy agenda of Turkey, and the I. Five-Year Development Program. Kemalist Thought System, its scope and Principles (republicanism, secularism, nationalism, populism, statism, reformism) and threats to those principles. The Atatürk Era and Turkish Foreign Policy in the Interwar Period I (1923-1930): Turkey's bilateral relations with the European states following the Lausanne Treaty. Turkish Foreign Policy in the Interwar Period II (1930-1938). The second World War. The second World war and Turkey. The World and Turkey in Developments in the second world war.		
EEM-232/ 4	Professional English	IV / Spring	Introduction. Given some information about lesson. Measurement of how student figure out themselves by English. English discussion about some work issue. Shapes, Reference [1], Chapter I page 1. Shapes, Physical Descriptions, Reference [1], Chapter II page 9. Matter, Reference [1], Chapter III page 14. Molecules in Motion, Reference [1], Chapter IV page 20 Acids, Bases and Salts Reference [1], Chapter V page 24. Acids, Bases and Salts, Reference [1], Chapter V page 24 Wave Motion, Reference [1], Chapter VI page 35. Generators	Name-Surname: Asst. Prof. Bilgin Zengin  E-mail: bilginzengin@munzur.edu.tr  Tel: +90 428 213 17 94- 2431	Electric and Electronics Engineering

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			and Faraday Reference [1], Chapter X page 58. Magnets and Magnetism Reference [1], Chapter XIV page 86. Conductors, semi-conductors and Insulators Reference [1], Chapter XXI page 140. Electrolysis Reference [1], Chapter XXII page 148. DC Motor Reference [2], Chapter (Unit) 3 page 27.		
EEM-234/ 4	Probability and Statistic	IV / Spring	Definition of probability. Probability actions. Probability and application areas of statistics. Discrete probability, randomness, finite probability space, probability measure, conditional probability, Bayesian theory. Discrete random variables, binomial, poisson, geometric distributions. Mean and variance. Integer random variables. Continuous random variables, exponential and normal distribution, probability density functions. Average and variance calculation, central limit theory, compound distributions. Linear regression and correlation. Multiple linear regression. Statistical estimation theory. Chi-square test. Curve fitting. Sampling distributions, nature and means of sampling, random approaches to sampling, simple method, flattened sampling, clustering. Data analysis, graphical and numerical operations. Markov chains, queuing.	Name-Surname: Prof.Dr. Muzaffer Aşkın E-mail: muzafferaskin@munzur.edu.tr Tel: +90 428 213 17 94- 2515	Electric and Electronics Engineering
EEM-236/ 6	Circuit Analysis	IV / Spring	Classes and properties of electrical circuits. State Equations and obtaining State Equations. Constant Coefficients Linear Circuits (CCLC) solution method, natural solution, special solution, forced solution. Solution method of Constant Coefficient Linear Circuits (CCLC); natural solution, special solution, forced solution. Laplace transform and its properties. Inverse laplace transformation. Definition of electrical circuit elements in s-domain and solutions of electrical circuits. S-domain solution of state equations. Finding the state transition matrix using the s-domain and self-solution. Solving the switching circuits by using the t-domain and s-domain. The relationship between zero-polar	Name-Surname: Prof.Dr. Muzaffer Aşkın E-mail: muzafferaskin@munzur.edu.tr Tel: +90 428 213 17 94- 2515	Electric and Electronics Engineering

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			distribution and response in s-plane. Transfer functions. Fourier series of electrical circuits applied for periodic input analysis.		
EEM-242/ 4	Analog Electronic-1	IV / Spring	Introduction of p and n type semiconductors. Understanding of p-n joint. Voltage-current curves of semiconductor diodes. Zener diodes and voltage regulators with zener diodes. Half and full wave rectification circuits. Clipper and clamper circuits. BJT transistors and their use in electronics. Examination of transistor working point and thermal stability. DC biasing circuits and analyzes of BJT transistors. Field effect (FET) transistors.	Name-Surname: Asst. Prof. Düzgün Akmaz E-mail: dakmaz@munzur.edu.tr Tel: +90 428 213 17 94- 2520	Electric and Electronics Engineering
EEM-240/ 5	Electromechanic Energy Conversion	IV / Spring	The introduction of electrical engineering and the current issues of electrical engineering. Basic principles of electromagnetic systems. Solution of electromagnetic circuit problems. The development of permanent magnet materials. Permanent magnet magnetic circuits. Solution of permanent magnet circuit problems. Energy balance equation for a electromechanic system. Correlation between energy, co-energy and torque. Energy, self and mutual inductances, torque in a linear electromechanic system. Solution of problems related to electromechanical systems. Analysis of reluctance motor. Single phase and three phases transformers. Auto transformers and instrument transformers.	Name-Surname: Asst. Prof. Zeki Omaç E-mail: zomac@munzur.edu.tr Tel: +90 428 213 17 94- 2475	Electric and Electronics Engineering
EEM-252/ 2	Employee Health and Safety	IV / Spring	Social security and social support plans. Development of health protection in Turkey. Turkish social security system. Legal basis of social insurance. Insured work, social insurance financing.	Name-Surname: Prof.Dr. Muzaffer Aşkın E-mail: muzafferaskin@munzur.edu.tr Tel: +90 428 213 17 94- 2515	Electric and Electronics Engineering
EEM-228/ 2	Measurement Lab.	IV / Spring	Creation of experimental groups and making the announcements. Laboratory courses related to the laboratory rules and functioning. Conducting to relevant groups of Experiment 1- Experiment 8. Doing make-up	Name-Surname: Asst. Prof. Düzgün Akmaz E-mail: dakmaz@munzur.edu.tr	Electric and Electronics Engineering

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			exam	Tel: +90 428 213 17 94- 2520	
EEM-333/ 4	Automatic Control-1	V / Winter	Control systems and units. Open and closed loop control systems and their properties. Modeling and analysis methods of continuous time control systems. Linearization, Characteristic equation, Transfer function. Block and signal flow diagrams for control systems. State equation and its solutions. Transfer matrix. Transfer function / polar zero distribution in the complex s-plane. Stability and stability methods; Routh-Hurwitz stability criterion. Time response behavior types performance of continuous time control systems. First order behavior systems and performance criteria. Systems of second order behavior and performance criteria. Determination of dominant poles and poles of high-order systems and time response. Ground curve of roots in the analysis of control systems.(Root-Locus) Investigation of system performance and stability with root curve of roots. Frequency analysis methods for linear systems; Bode diagram and frequency response performance criteria. Frequency response performance criteria and stability. Polar diagram, Nyquist diagram and stability method. Amplitude-phase diagram.	Name-Surname: Asst. Prof. Zeki Omaç E-mail: zomac@munzur.edu.tr Tel: +90 428 213 17 94- 2475	Electric and Electronics Engineering
EEM-303/ 6	Electrical Machines-1	V / Winter	Introduction to electrical machines. Classification. Transformers. Rotational Motion; Power relations; Force and induced voltage analysis in a conductor. Transformer types and construction; Single-phase transformers. Equivalent circuit and parameter measurement of a transformer; Voltage regulation and efficiency. Autotransformer and three-phase transformers; measuring transformers. Principles of direct current machines; Linear direct current machines. Commutation and armature reaction in direct current machines. The structure of the industry in direct current machines; moment and induced voltage statements. Power flow	Name-Surname: Asst. Prof. Zeki Omaç E-mail: zomac@munzur.edu.tr Tel: +90 428 213 17 94- 2475	Electric and Electronics Engineering

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			and losses in direct current machines; direct current generators. Direct current generator types and parallel operation. Direct current motors; equivalent circuit; varieties. Starting of direct current motors; speed control; block diagram and transient analysis. Introduction to brushless DC motors; permanent magnets. Operation principle of brushless DC motors and control methods.		
EEM-305/ 4	Power Systems 1	V / Winter	Entry for power systems, classification. Generating, transmission and distribution voltages. General structure, units and properties of a generating institution. Power transmission line. Nominal pi and nominal T circuit. Calculation of resistance, inductance and capacitance at transmission lines. Mechanical structure of transmission lines. Conductors and it's properties. Stranded and bunched. LV, MV and HV cables. Insulators, it's structure, types and properties. Potential distribution in insulators. LV, MV, HV and VHV pillars and it's peak strength. Power switches; disconnecter types and it's properties. Interruptor types and it's properties and interrupt techniques. Bus bars and bus bar systems. Series compensation in transmission lines.	Name-Surname: Asst. Prof. Düzgün Akmaz E-mail: dakmaz@munzur.edu.tr Tel: +90 428 213 17 94- 2520	Electric and Electronics Engineering
EEM-315/ 5	Analog Electronics-II	V / Winter	Properties of OP-AMP and characteristics. OP-AMP Offset voltage and current and polarization current. Inverting and non-inverting amplifiers. Difference and instrumentation amplifiers. Basic op-amp circuits. Non-ideal amplifiers. Oscillator circuits. Sensitive rectifiers, clippers and wave form generators. Comparators, logarithmic amplifiers. Big signal amplifiers, A,B and C class working and efficiencies. Regulated power sources; shunt, series current limited and switched regulator circuits. UJT and applications. Electronic circuit design method of transistor, triac and diac components.	Name-Surname: Asst. Prof. Düzgün Akmaz E-mail: dakmaz@munzur.edu.tr Tel: +90 428 213 17 94- 2520	Electric and Electronics Engineering

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EEM-309/ 2	Professional Practice 1	V / Winter	Profession Practice-1 is executed in determined within framework of “Engineering Faculty Practical Work (Internship) Directive” and “Student Internship Guidelines of Department” in week days. Relevant juries listen what students made as related to their internship presentations and they assessment by asking questions.	Name-Surname: Prof.Dr. Muzaffer Aşkın E-mail: muzafferaskin@munzur.edu.tr Tel: +90 428 213 17 94- 2515	Electric and Electronics Engineering
EEM-335/ 6	Logic Circuits	V / Winter	Analog and digital concepts, number systems, binary codes. Boolean algebra, digital logic gates, integrated circuits. Simplification of Boolean functions, karnaugh maps, table method (Quine McCluskey). Analysis and design of integrated circuits: mathematical processing circuits. Analysis and design of integrated circuits: comparison circuits, decoders, encoders. Analysis and design of integrated circuits: multiplexers, data dispenser, programmable structures. Analysis and design of sequential circuits: Mealy, Moore models, flip flops and implementation circuits. Analysis and design of sequential circuits, asynchronous counters. Analysis and design of sequential circuits, synchronous counters. Analysis and design of sequential circuits, ring, Johnson counter, implementation circuits. Records and memories. Asynchronous sequential logic circuits. Algorithmic state machines.	Name-Surname: Asst. Prof. Düzgün Akmaz E-mail: dakmaz@munzur.edu.tr Tel: +90 428 213 17 94- 2520	Electric and Electronics Engineering
MMÜ-327/ 3 <b>Technical Elective</b>	Engineering Mechanics	V / Winter	Definition and classification of mechanics, purpose, basic concepts. Principles of Mechanics - Newton's Laws, Dimension Analysis. Vectors. Forces. Moment. Equilibrium: Balance of Plane and Space Systems. Weight Centers; center of gravity of linear elements. Geometrical center of plane surfaces, Volume centers, Mass centers. Moment of Inertia, Mass Moment of Inertia. Dynamic equilibrium, Inertial force. Kinematics (Displacement - Speed - Acceleration). Derivatives of vector functions, Absolute and Relative motion. Coordinate Transformations. Kinetic (Force - Mass - Acceleration), Equations of motion.	Name-Surname: Asst. Prof. Bilgin Zengin E-mail: bilginzengin@munzur.edu.tr Tel: +90 428 213 17 94- 2431	Electric and Electronics Engineering



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EEM-358/ 6	Microprocessors	VI / Spring	Binary number systems, arithmetic units, accumulator logic, CPU, RAM, ROM, EEPROM concepts, differences between microprocessor-microcontroller. Memory basics and memory organization, 8085 8-bit microprocessor structure, 8085 hardware and software architecture, the address and data bus, flags. 16-bit microprocessors, introduction to 80286 microprocessors, the address bus, register structure, segmented memory structure. The addressing modes at 80286 microprocessors, data addressing modes, programme memory addressing. Basic 80286 commands (data transfer command, arithmetic and logic command, addition, subtraction, division, multiplication, comparison, and / or, rotation, shift commands). Stack and subprograms, string comparison, programme check commands, branching commands. Digital / analog conversion and 80286 microprocessor software programming examples. Digital / analog conversion. Analog /digital conversion. Introduction to interrupt, software interrupt, hardware interrupt. Microcontroller family, PIC microcontroller hardware structure, the commands applied on byte, the commands applied on bit, data processing and control commands. Flash, RAM, addressing modes, the concept of changing banks, ports, special purpose registers. Environmental interface concept, environmental interrupts. Time delay, timer interrupts, counters, microcontroller programming examples.	Name-Surname: Asst. Prof. Düzgün Akmaz E-mail: dakmaz@munzur.edu.tr Tel: +90 428 213 17 94- 2520	Electric and Electronics Engineering
EEM-304/ 4	Electrical Machines 2	VI / Spring	Introduction to AC Machine Fundamentals. Magneto motive Force and Flux Distribution in AC Machines, Induced Voltage in AC Machines; Induced Torque in AC Machines; Distributed Windings in AC Machines. Asynchronous motor structure, equivalent circuit and moment. The transformer model of asynchronous motor. Analysis of power and moment-speed characteristics in	Name-Surname: Asst. Prof. Zeki Omaç E-mail: zomac@munzur.edu.tr Tel: +90 428 213 17 94- 2475	Electric and Electronics Engineering

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			asynchronous motors. Orientation and design classes in asynchronous motor design. Asynchronous motor starting and speed control. Asynchronous generator. Asynchronous motor starting and speed control. Asynchronous generator. Single-phase asynchronous motors. Theory of double rotating field of single-phase asynchronous motors. Start of single-phase motors. Shadow pole motors. Synchronous generators; Equivalent circuits of synchronous generators, phasor diagram, power and moment expressions. Local and parallel operation of synchronous generators. Transient analysis of synchronous generators. Continuous state analysis of synchronous motors. Starting of synchronous motors.		
EEM-306/ 4	Power Systems 2	VI / Spring	Construction and presentation of power systems. Single line, impedance and reactance diagrams. Per unit (p.u.) values. Selection and change of base for p.u. values. Sample calculations. Per unit (p.u.) values. Selection and change of base for p.u. values. Sample calculations. Symmetrical triphase faults in synchronous machine. Investigated of a synchronous generator in short circuit. Reactance and short circuit currents of synchronous machine. Internal voltage of loaded machines under transient conditions. Calculation with thevenin equivalent circuit. Symmetrical constituents. Symmetrical constituents of asymmetrical phasors, operators, power in symmetrical constituents. Serial impedances of circuit elements, serial circuits of unloaded generators. Positive, negative and null serial circuits. Investigate with symmetrical constituents of asymmetrical and symmetrical faults in an unloaded generator. Asymmetrical and symmetrical faults in power systems. Asymmetrical and symmetrical faults in power systems. Connection of serial circuit according to fault types. Connection of serial circuit according to	Name-Surname: Asst. Prof. Düzgün Akmaz E-mail: dakmaz@munzur.edu.tr Tel: +90 428 213 17 94- 2520	Electric and Electronics Engineering

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			fault types. Earthing and it's varieties. Earthing types and potential arrangement. Effect to earthing of star point state.		
EEM-308/ 5	Power Electronics	VI / Spring	Introduction to power electronics, related topics. Semiconductor devices: Diode, Thyristor, Triac, Power Transistor, MOSFET, IGBT, GTO, MCT, SIT, IGCT, MOS turn-off, Thyristor. Calculation of losses in power semiconductor devices; (conduction loss, switching loss). Heat sink design. Design of snubber circuits. Gate drive circuits and isolation. Single phase AC choppers. Rectifiers. Single phase uncontrolled (diode) bridge rectifiers. Smoothing methods. Power factors. Single phase controlled (thyristor) bridge rectifiers. Analysis of Three phase half-bridge uncontrolled(diode) / controlled (Thyristor) rectifiers. Free wheeling operation. Three phase full-bridge uncontrolled (diode) rectifiers. Characteristics of line current. Three phase full-bridge controlled (Thyristor) rectifiers. DC thyristor choppers. Two-Thyristor DC chopper. Resonance commutation DC chopper. Single Phase Inverter. Voltage and frequency control methods of the single-phase inverter: quasi-square wave and PWM techniques. Analyze of the single phase inverter. Harmonic analysis. Modulation index, frequency ratio.	Name-Surname: Asst. Prof. Zeki Omaç E-mail: zomac@munzur.edu.tr Tel: +90 428 213 17 94- 2475	Electric and Electronics Engineering
EEM-344/ 6	Computer Aided Analysis in EEE	VI / Spring	Introduction and use of Matlab package program. Introduction to numerical analysis. Definition of error, types of error. Root finding methods. Solution of the linear equation system with numerical methods. Solution of the nonlinear equation system with numerical methods. Numerical differentiation. Numerical integration. Interpolation. Curve fitting. Numerical solutions of ordinary differential equations. Matlab applications.	Name-Surname: Asst. Prof. Bilgin Zengin E-mail: bilginzengin@munzur.edu.tr Tel: +90 428 213 17 94- 2431	Electric and Electronics Engineering
EEM-346/ 2	Electronics Lab.	VI / Spring	Explanation of experiments and laboratory rules, orientation of the experimental laboratory. Current	Name-Surname: Asst. Prof. Düzgün Akmaz	Electric and Electronics

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			voltage characteristic of diode. Examination of half-wave and full-wave rectification circuits. Analyzing of clipping and clamping circuits. Zener diode voltage regulators. Transistor amplifiers. FET amplifiers and their implementations. E-MOS and D-MOS implementations. Implementations of operational amplifiers.	E-mail: dakmaz@munzur.edu.tr Tel: +90 428 213 17 94- 2520	Engineering
EEM-354/ 3 <b>Technical Elective</b>	Electric Energy Generation Systems	VI / Spring	Traditional, New and Renewable energy sources. Classification in hydroelectric power plants, power calculation in HPP. Water intake structure in HPP, Grid, lid, valve, balance shaft, force tunnel, penstock. Types of hydraulic turbines: Kaplan, Francis and Pelton turbines. Structural properties. Cavitation and vortex events in water turbines. Frequency and voltage stability of the HPPs (speed and voltage regulation). Thermal power plants; January, boiler, pressure steam systems, condenser and cooling towers. Structure and working properties of nuclear power plants. Reactor types. Moderator and control bars. Generating electricity from solar energy. Solar cell systems and solar power plants. Wind farms. Wind turbines and types. Elements of wind power plant. Force (Diesel) Power Plants. operation and characteristics. Fuel Cells, hydrogen production and storage. Power generation and statistics in power plants. Daily load and energy curves.	Name-Surname: Asst. Prof. Bilgin Zengin E-mail: bilginzengin@munzur.edu.tr Tel: +90 428 213 17 94- 2431	Electric and Electronics Engineering
EEM-401/ 8	Design in EEE	VII / Winter	Gaining ability to work in a team. Applying the duty share in a team. Applying the engineering knowledge to a design project. Designing a prototype. Gaining ability to write a report and give an oral presentation.	Name-Surname: Asst. Prof. Düzgün Akmaz E-mail: dakmaz@munzur.edu.tr Tel: +90 428 213 17 94- 2520	Electric and Electronics Engineering
EEM-405/ 2	Professional Practice 2	VII/ Winter	Profession Practice-2 is executed in determined within framework of “Engineering Faculty Practical Work (Internship) Directive” and “Student Internship Guidelines of Department” in week days. Relevant juries	Name-Surname: Prof.Dr. Muzaffer Aşkın E-mail: muzafferaskin@munzur.edu.tr	Electric and Electronics Engineering

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			listen what students made as related to their internship presentations and they assessment by asking questions.	Tel: +90 428 213 17 94- 2515	
EEM-453	Industrial Measurement	VII/ Winter	Transducers, Potentiometers. Linear Variable Differential Transformer (LVDT). Pressure transducers: Bourdon tubes, Belows. Temperature sensors: Thermocouples. Thermistors and resistive temperature sensors. Optical position measurement, strain sensors. Acceleration sensors, humidity sensors. Fluid velocity measurement with electromagnetic method, Measurement using fluidmeter with narrow part. Speed measurement with thermistors. Photocells, photovoltaic devices and their applications. Fluid measurement by using electro acoustic method. Three-phase active and reactive power measurements by using two wattmeters.	Name-Surname: Asst. Prof. Bilgin Zengin E-mail: bilginzengin@munzur.edu.tr Tel: +90 428 213 17 94- 2431	Electric and Electronics Engineering
EEM-409/ 2	Electrical Machines Lab.	VII/ Winter	Experiment-1: D.C. Inspection and braking. Experiment-2: Measurement of Basic Parameters in Electrical Machines. Experiment-3: Thyristor Drive System with D.C. Engine Speed Control. Experiment-4: Removal of Equivalent Circuit Parameters of Transformers. Experiment-5: Investigation of Three Phase Asynchronous Motor and Generator. Experiment-6: Investigation of Single Phase Asynchronous Motors with Capacitor Start and Continuous Capacitors. Experiment-7: Investigation of Synchronous Motor and Generator. Experiment-8: Investigation of Step Motors. Experiment-9: Open Cycle Speed Control with Three-Phase Asynchronous Motor Powered by Inverter. Experiment-10: Brushless D.C. Engines.	Name-Surname: Asst. Prof. Zeki Omaç E-mail: zomac@munzur.edu.tr Tel: +90 428 213 17 94- 2475	Electric and Electronics Engineering
EEM-455/ 3 <b>Technical Elective</b>	Protection in Power Systems	VII/ Winter	Basis principle of protection. Making protection with fuse in LV and HV systems. Relays and it's features. Over voltage relay, impedance relay and making protection with differential relay. Protection of generator and line. Protection of transformer. Protection of motor. Relay coordination. Protection mechanism against to over voltage. Surge arrester, it's structure, operating	Name-Surname: Asst. Prof. Düzgün Akmaz E-mail: dakmaz@munzur.edu.tr Tel: +90 428 213 17 94- 2520	Electric and Electronics Engineering

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			feature and selection. Protection lines. Skip distances.		
EEM-459/ 3 <b>Technical Elective</b>	Communication Systems	VII/ Winter	Introduction to communication systems. Signals and modulation. Derivation filters and functions. Basic band signal types. The need for modulation and classification of modulation types. Amplitude modulation. Amplitude modulator and demodulator circuits. Frequency modulation. Phase modulation. Conversion of analog signals to digital signals, sampling, quantization, coding. Theory of digital modulation. Pulse time modulation. Pulse width modulation. Pulse code modulation. Wireless transmission of digital signals. Amplitude shift keying. Frequency shift switching. Phase shift switching.	Name-Surname: Asst. Prof. Bilgin Zengin  E-mail: bilginzengin@munzur.edu.tr  Tel: +90 428 213 17 94- 2431	Electric and Electronics Engineering
EEM-461/ 7 <b>Technical Elective</b>	Illumination Technique and Domestic Installation Project	VII/ Winter	The subject and purpose of lighting. Lighting types and lighting fixtures. Photometric magnitudes (luminous flux, amount of light, light intensity. Luminance level, photographic stimulation, photometric radiance, glare). Photometric laws (Cosine law, inverse proportional law with distance square, Lambert's law, Space angle projection law). Solving sample problems related to photometric laws. Components of illumination, Light and vision, foundations of light production. Light sources (Incandescent lamps, arc lamps, discharge lamps), Lighting calculation. Electrical interior installation materials. Electrical accidents and measures against them. The characteristics of the 1/50 scale architectural exercise project that should be provided, the project materials. Classification of electrical internal installation, construction of a building, electrical internal installation. Wiring diagrams. Important articles of the Regulation on Electrical Internal Facilities. Drawing of a typical apartment building, floor and basement floor electrical installation works. Project control: Drawing of open and single line diagrams. Project control: Drawing	Name-Surname: Asst. Prof. Zeki Omaç  E-mail: zomac@munzur.edu.tr  Tel: +90 428 213 17 94- 2475	Electric and Electronics Engineering

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			of strong current column diagram. Preparation of table loading table. Fuse selection, selection of wire section, calculation of voltage drop, voltage drop problems.		
EEM-467/ 2 <b>Technical Elective</b>	Logic Circuits Lab.	VII/ Winter	Experiment 1: TTL and MOS gate characteristics. Experiment 2: Combined circuit analysis. Combined circuit design. Experiment 3: Combined circuit analysis and design with MSI circuit elements. Experiment 4: Design of collection, subtraction and comparison circuits with block structures. Experiment 5: Synchronous sequential circuit analysis. Synchronous sequential circuit design. Experiment 6: Asynchronous and synchronous sequential counter design. Programmable door series on the field.	Name-Surname: Prof.Dr. Muzaffer Aşkın  E-mail: muzafferaskin@munzur.edu.tr  Tel: +90 428 213 17 94- 2515	Electric and Electronics Engineering
EEM-402/ 2	Business Law	VIII/Spring	Introduction to labor law. Important laws of labor law. Basic concepts of labor law. Application areas of labor law. Types of employment contract. Works where the employment contract is prohibited. Rights and obligations of the employer and the employer arising from the employment contract. Termination of employment contract, working hours, permits and fees. Social security concept. Trade unions law. Collective labor law. Strike. Lockout. Rights and interests disputes.	Name-Surname: Prof.Dr. Muzaffer Aşkın  E-mail: muzafferaskin@munzur.edu.tr  Tel: +90 428 213 17 94- 2515	Electric and Electronics Engineering
EEM-404/ 12	Graduation Project	VIII/Spring	To apply the knowledge and skills acquired in previous coursework to solve a specific problem and/or acquire in-depth knowledge on a specific topic. To give the ability to do a literature search. To desing and do experiments having literature knowledge of the students. To teach software technologies to the students in order to do research. To gain skills with individual and groups works of students. To evaluate and interpret the obtained research results and to obtain the project skills having writing.	Name-Surname: Asst. Prof. Bilgin Zengin  E-mail: bilginzengin@munzur.edu.tr  Tel: +90 428 213 17 94- 2431	Electric and Electronics Engineering
EEM-406/ 2	Electrical Installation Lab.	VIII/Spring	Obtain the characteristic values for the transmission line. Calculation of voltage drop in transmission line. Investigation of the earth fault on the transmission line.	Name-Surname: Asst. Prof. Düzgün Akmaz	Electric and Electronics Engineering

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			Short circuit test with short circuit transformer and double transformer on line model. Voltage drop on cables. High voltage experiments-1. High voltage experiments-2.	E-mail: dakmaz@munzur.edu.tr Tel: +90 428 213 17 94- 2520	
EEM-400/ 4	High Voltage Technique	VIII/Spring	Introduction to high voltage technique. Planar electrot systems, electric field and potential calculation. Spherical electrot systems, electric field and potential calculation. Cylindrical electrot systems, electric field and potential calculation. Investigating breakdown and economy of electrot systems. Multilayer electrot systems. Breakdown at boundry surfaces. Corona events transmission line and calculation of corona losses. Dielectric losses and capacity measurement. Measuring with spherical electrodes. Over-voltage and its features.	Name-Surname: Asst. Prof. Düzgün Akmaz E-mail: dakmaz@munzur.edu.tr Tel: +90 428 213 17 94- 2520	Electric and Electronics Engineering
EEM-438/ 2 <b>Technical Elective</b>	Power Electronics Lab.	VIII/Spring	Single phase controlled and uncontrolled rectifiers. Multiphase controlled and uncontrolled rectifiers. Snubber circuit design. DC-DC buck converter. DC-DC boost converter. Analyzing components of power electronics.	Name-Surname: Asst. Prof. Zeki Omac E-mail: zomac@munzur.edu.tr Tel: +90 428 213 17 94- 2475	Electric and Electronics Engineering
EEM-448/ 5 <b>Technical Elective</b>	Energy Distribution and Project	VIII/Spring	LV distribution project sustaining an area consist of distributed load with two distribution transformers. Drawing principle for distribution project. Illumination features at road, bend and crossroads. Position principle of transformers. Determination of pillar location. Drawing of draft project. Calculation of pillar power. Calculation of moment and conductor. Determine of line orders. Control as to heating and voltage drop. Calculation of transformer power and drawing of single line schema. Types of pillar and traverse and it's calculation and selection. Drawing of LV energy distribution project. Route etude of MV power transmission line. Plan and profile of MV power transmission line. Type projects with 3 AWG conductor.	Name-Surname: Asst. Prof. Zeki Omac E-mail: zomac@munzur.edu.tr Tel: +90 428 213 17 94- 2475	Electric and Electronics Engineering



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EEM-450/ 3 <b>Technical Elective</b>	Special Electrical Machines	VIII/Spring	The situations special electrical machines are used. Classification of special electrical machines; permanent magnets and its applications. Permanent magnet DC and Synchronous machines. The Equivalent circuits, constructions and applications of Permanent magnet DC and Synchronous machines. Hysteresis and Reluctance Machines. Stepper Motors; types, constructions and control principles. Mass-rotor induction machines. Rotational, linear motion Machines; Equivalent circuits, parameters and applications. Axial flux electrical machines. Reactions of special electric machines under changeable voltage and frequency. Analysis of special electric machines. Field investigation for special electric machines. Design principles of special electric machines.	Name-Surname: Asst. Prof. Zeki Omaç E-mail: zomac@munzur.edu.tr Tel: +90 428 213 17 94- 2475	Electric and Electronics Engineering
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