ELECTRICAL - ELECTRONICS ENGINEERING FOR STUDENTS WHO START THEIR EDUCATION IN DEPARTMENT BEFORE 2019-2020 ACADEMIC YEAR FALL SEMESTER						
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
English-I	EL 101	Fall	03+00+00	Compulsory	3	4
Course Objectives:	Reading: By the end of the course, students will be able to read extracts from authentic texts on a variety of topics and in a variety of genres and build on the following skills: Skimming: Finding the main ideas quickly, Skimming: Making predictions, Scanning: Finding specific information quickly, Identifying supporting details, Recognizing organization and purpose in written texts, Recognizing relationships within a written text, Understanding coherence and cohesion, Recognizing cohesion, Recognizing summary statements and conclusions, Distinguishing essential/ non-essential information in written texts Writing: By the end of the course, students will be able to produce an organized essay as well as: Organize a written response to a text, Understand essay introductions and their relationship to the body of the essay, Write clear thesis statements, Support major points with supporting details, Write body paragraphs using connecting ideas to show relationships Vocabulary: The course will develop and expand student's knowledge of commonly used academic vocabulary as well as vocabulary related to the themes covered by the course.					
Course Contents:	Unit 2: Megacities (Urban Planning) Unit 3: In the Public Eye (Art & Design) Unit 4: Staying Alive (Public Health)					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Engineering Guide and Ethics	GE 103	Fall	03+00+00	Compulsory	3	5
Course Objectives:	To be a guide for students in their undergraduate study. To give the student an understanding of the engineering profession and the main engineering problems on the global and social dimensions within the society health, environment, security context. To collaborate in small groups to analyze a case and identify the problem, to synthesize a solution, to formulate arguments for a debate and to develop communication skills. Developing skills in moral reasoning, having an understanding of ethical and legal implications of the engineering profession. Consciousness in academic ethics. Consciousness in lifelong learning.					
Course Contents:	This is a course delivered in blended form. All course materials about theoretical subjects are delivered via the Blackboard portal in online form. Quizes will also be carried online. There are two hours of lecture every week where practical studies, discussions, and workshops will be carried out. Topics covered: The academic system and courses. The engineering profession; engineering questions; modeling processes; electrcial-electronics/computer/industrial engineering; implications of engineering on society, environment, health, and security; necessary soft skills for engineers: teamwork, communication, writing, presentation, lifelong learning; professionalism: client-employee relations; ethics, ethical reasoning and problem solving; legal implications of engineering; moral responsibility and whistle-blowing; academic ethics; codes of ethics; case studies.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Calculus I	MA 101	Fall	03+02+00	Compulsory	4	7
Course Objectives:	1. To give a broad knowledge and basic understanding of sequences and series. 2. To teach the concepts of functions, limits, continuity, and differentiation. 3. To help the students to demonstrate the ability to use the derivative concept in applications. 4. To demonstrate the ability to apply knowledge of mathematics to engineering problems.					
Course Contents:	Classification of real numbers, complex numbers. Sequences and series. Tests for convergence and divergence of series, power series. Functions, domain and range. Functions of a single variable. Classification of functions. Limits, continuity and related theorems. Derivatives, differentials. Rolle`s Theorem, Mean Value Theorem. Indeterminate forms, L`Hospital`s Rule. Taylor and Mac-Laurin series. Local and absolute maxima and minima of functions. Curve sketching.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Linear Algebra	MA 103	Fall	03+00+00	Compulsory	3	6
Course Objectives:	To develop the theory of matrices, systems of linear equations, vectors and vector spaces, with emphasis on concepts and techniques used in physics and engineering.					
Course Contents:	Systems of linear equations, the matrix equation, linear independence, matrix algebra, echelon form of a matrix, Gauss-Jordan elimination, inverse of a matrix, vector spaces and subspaces, basis for a vector space, determinants, dimension and rank of vector spaces, eigenvalues and eigenvectors, diagonalization, orthogonality.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Physics I	PH 121	Fall	03+00+00	Compulsory	3	5
Course Objectives:	The main objective of this course is to introduce basics of the clasical mechanics and to introduce the theories and applications in a clear, understandable way. The students are also motivated through practicle examples and homeworks.					
Course Contents:	Measurements, Vectors, Motion in one dimension, Motion in two dimension, Newton`s laws of motion, Application of Newton`s law, Newton`s law of universal gravitation, Work and energy, Conservation of energy, Momentum and motion of the system, Static equilibrium on a rigid body, Rotation I, Rotation II					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Physics Laboratory I	PH 131	Fall	00+00+02	Compulsory	1	2
Course Objectives:	The main objective of this course is to introduce basics of the clasical mechanics and to introduce the theories and applications in a clear, understandable way.					

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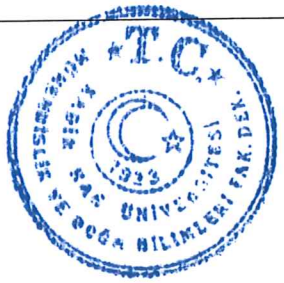

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Course Contents:	Measurements, Vectors, Motion in one dimension, Motion in two dimension, Newton's laws of motion, Application of Newton's law, Newton's law of universal gravitation, Work and energy, Conservation of energy, Momentum and motion of the system, Static equilibrium on a rigid body, Rotation.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Turkish Language I	TD 101	Fall	02+00+00	Compulsory	2	1
Course Objectives:	Gaining an historical perspective about Turkish Language. Improving critical reading and writing in Turkish. Analysing argumentative essays Joining a process of production of knowledge through communication Writing a book review Gaining knowledge about academic ethics					
Course Contents:	Content of the course depends on argumentative essays and analysis of them. Reading material also includes articles about the history of Turkish Language, short paragraphs and argumentative essays as well as an essay-type book written by a Turkish writer.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Computer Programming I	CE 140	Spring	02+00+02	Compulsory	3	5
Course Objectives:	This is a good course for those with little or no programming experience. Students develop skills to program and use computational techniques to solve problems. Topics include the notion of computation, simple algorithms and data structures, using an editor, program design, implementation with Python, testing and debugging, and algorithmic complexity.					
Course Contents:	Software, hardware, problem solving (algorithms and pseudocode), Python programming language, input and output operations, variables, arithmetic and data types, conditional statements, loops, scoping, collections, introduction to functions and recursion.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Chemistry	CH 101	Spring	03+00+02	Compulsory	4	6
Course Objectives:	To teach the basic concepts of chemistry and understand direct chemical changes. To perceive a connection between an observation in the "real" macroscopic world and an imagined change in the microscopic world, the world of atoms, ions and molecules.					
Course Contents:	Matter, its properties and units. Atoms, Molecules, and Ions. Types of chemical compounds. Mole concept. Chemical reactions. Stoichiometry. Acids and bases. Precipitation Reactions. RedOx Reactions. Solutions and their Concentrations. Thermochemistry. Electronic Structure of Atoms. Quantum theory. Electronic configuration. Periodic Table and its Properties. Lewis Symbols. Basics of Chemical Bonding. Molecular Shapes. The VSEPR Model.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
English II	EL 102	Spring	03+00+00	Compulsory	3	4
Course Objectives:	SPEAKING & LISTENING By the end of the course, students will be able to participate in seminar discussions and give formal presentations on a variety of topics and build on the following skills: Speak English fluently, Speak clearly and concisely, Deliver an individual presentation, Formulate an appropriate communication strategy for a given situation, Give and receive feedback in order to improve communication, Listen for understanding, Work effectively in groups, Express ideas effectively individually and in groups, Participate in a debate VOCABULARY The course will develop and expand student's knowledge of commonly used academic vocabulary as well as vocabulary related to the themes covered by the course.					
Course Contents:	Unit 2: Learning Online Unit 3: Changing Roles in the Family Unit 4: A Healthy Lifestyle Unit 5: The Influence of the Media Unit 7: The World of Work Unit 8: Protecting the Environment					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Calculus II	MA 102	Spring	03+02+00	Compulsory	4	7
Course Objectives:	1. To give a broad knowledge and basic understanding of integral calculus, 2. To teach the techniques of integration, 3. To help the students to demonstrate the ability to use the integration concept in applications, 4. To teach the fundamentals of the vector calculus and use them in applications, 5. To teach the concepts of limit, continuity, and partial derivative for multivariable functions.					
Course Contents:	Indefinite integrals: Rules of integration, basic integration formulas, integration by substitution. Techniques of integration: Integration by parts, some recurrence relations, integration of rational functions, integrals that can be transformed to those of rational functions. Definite integral: Riemann sums, Mean Value Theorem for integrals, Fundamental Theorem of the integral calculus. Applications of Integrals: Areas of plane regions in Cartesian, parametric and polar coordinates, finding the lengths of plane curves given by Cartesian equation, parametric equations and polar equation, volumes of solids of revolution, areas of surfaces of revolution. Improper integrals: Kinds of improper integrals, tests of convergence and divergence. Numerical integration: Method of Trapezoids, method of parabolas (Simpson). Vectors and their applications: Vectors, dot product, cross product and triple scalar product of vectors. Lines and planes in space and some related topics. Multivariable functions: A brief account of the theory of functions of several variables. Limit and continuity,. partial derivative, total differential and exact differential forms. Homogeneous functions, Euler?s theorem.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Physics II	PH 122	Spring	03+00+00	Compulsory	3	5

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Course Objectives:	The main objective of this course is to introduce basics of the electric and magnetism and to introduce the theories and applications in a clear, understandable way. The students are also motivated through practicle examples and homeworks.					
Course Contents:	Coulomb?s Law and the Electric Field, Gauss?s Law, Electrical Potential, Capacitance, Electric Energy, and Properties of Insulators, Current and Resistance, Energy and Currents in DC Circuits, The Magnetic Field, Sources of Magnetic Field Faraday?s Law, Inductance, Magnetic Field in Matters Electromagnetic Oscillations and AC Circuits					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Physics Laboratory II	PH 132	Spring	00+00+02	Compulsory	1	2
Course Objectives:	The main objective of this course is to introduce basics of the electric and magnetism and to introduce the theories and applications in a clear, understandable way.					
Course Contents:	Coulomb's Law, Electric Field and Potential, Dielectric Constant, Charging and Discharging of a Capacitor, Ohm's Law, Temperature Dependence of Resistance, Kirchhoff's Law, Biot-Savart's Law, Magnetic Moment and Induction					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Turkish Language II	TD 102	Spring	02+00+00	Compulsory	2	1
Course Objectives:	To give an idea about different literary genres such as novel, short story and poem and to concentrate on some Turkish examples. The course aims to provide knowledge about literary terms as well as historical perspective concerning these genres.					
Course Contents:	This course covers the following subjects: The rise of the Turkish novel, the relation of Turkish novel with traditional genres, some key terms in narratology such as narrator, narrative modes and characterization etc., close reading techniques, Turkish novel from 50?s to 2000?s, short story and poem in Turkish.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Principles of Atatürk and History of Turkish Republic I	AT 101	Fall	02+00+00	Compulsory	2	1
Course Objectives:	Öğrencilere, ülkenin Sevr koşulları çıkmazından, bağımsız Türk Devleti noktasına nasıl ve ne şekilde geldiğini; evrensel bir çağdaşlaşma anlayışı olan Atatürkçü Düşünce Sistemi'nin tüm yönlerini, farklılıklılığını ortaya koyarak aktarılması amaçlanmaktadır.					
Course Contents:	Osmanlı'nın çökme nedenleriyle birlikte, Tanzimat Döneminden başlayan süreç ile Bağımsızlık mücadelesinden Lozan'a kadar geçen dönem tüm ayrıntıları ile verilmektedir.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Materials Science	CH 201	Fall-Spring	02+00+00	Elective	2	3
Course Objectives:	The student will 1. Demonstrate proficiency in understanding the basic concepts of material science. 2. Develop a structure properties perspective 3. Be able to interpret related structures 4. Become familar with the technical jargon of materials science.					
Course Contents:	Introduction to Material science and engineering. Atomic structure. Crystal structure. Crystal geometry. Electrical properties of materials. Semiconductors. Polymeric Materials. Methods of Polymerization. Industrial Polymers. Magnetic properties of the materials.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Circuit Theory I	EE 201	Fall	04+00+00	Compulsory	4	7
Course Objectives:	To give the definitions of basic circuit variables and elements, to explain the basic circuit analysis techniques, and to obtain the natural and step responses of the circuits containing RL, RC and RLC elements, to analyse the circuits conatining operational amplifiers.					
Course Contents:	Circuit variables; circuit elements; simple resistive circuits; techniques of circuit analysis; operational amplifier and applications; inductance and capacitance; response of first order RL and RC circuits; natural and step responses of RLC circuits.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
İngilizce-III	EL 201	Fall	03+00+00	Compulsory	3	4
Course Objectives:	READING By the end of the course, students will have developed their ability to cope with authentic academic texts at the B2 level on a variety of academic topics. In addition to the skills they have developed in English Two, they will be able to: Read for general understanding, Differentiate between main ideas and supporting details, Paragraph reorganization: Looking at the logic of the text, Read for specific details and purpose, Read and mind mapping, Read and summarize the SQ3R system, Paraphrase and summarize information in a text The course will continue to develop students abilities to: Guess the meaning of unknown words from the context, Infer meaning from context, Compare texts and reading for detail WRITING During this course students will get a practice of the skills they have learned in English One and English Two. By the end of the course, students will be able to: Elaborate on information from outside sources, Summarize academic texts, Paraphrase and quote sentences to form a summary writing, Write responses to academic texts, The course will continue to reinforce the importance of avoiding plagiarism.					
Course Contents:	Unit One: Reading for Academic Purposes Unit Two: Sustainable energy Unit Three: The business of Science Unit Four: Society Today					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Digital Design	EE 205	Fall	03+00+00	Compulsory	3	5

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Course Objectives:	This course aims to introduce the Boolean algebra and, basic analysis and synthesis techniques for logic circuits. Both combinational and sequential circuits are covered. However, the emphasis is on combinational circuits.					
Course Contents:	Boolean Algebra; logic networks and their simplification; logic design techniques with gates and MSI chips; combinational circuits; basic sequential circuits.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Differential Equations	MA 201	Fall	03+00+00	Compulsory	3	6
Course Objectives:	1.To introduce the basic concepts required to understand , solve and iterpret differential equations. 2.To teach methods to solve differential equations of various types. 3.To give an ability to use knowledge of mathematics in engineering problems.					
Course Contents:	First order equations Separable equations, linear equations, exact equations and integrating factors, integration by a change of variable (homogeneous equations and Bernoulli equation etc.) Picard?s iteration method. Second order equations whose solutions can be obtained by integrating first order equations. Second order linear equations General theory and definitions. Homogeneous equations with constant coefficients. The method of reduction of order. Non-homogeneous equations, the method of undetermined coefficients and the method of variation of parameters. Higher order linear equations General theory and definitions. Homogeneous equations with constant coefficients. Non-homogeneous equations, the method of undetermined coefficients and the method of variation of parameters Systems of first order linear equations Homogeneous linear systems with constant coefficients. Non-homogeneous systems and the method of variation of parameters. The Laplace transform method Basic definitions and theorems. Heaviside and delta functions and their Laplace transforms. Solutions of initial value problems by the Laplace transform method. Convolution. Power Series Methods Series solutions near regular and regular singular points					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Principles of Atatürk and History of Turkish Republic II	AT 102	Spring	02+00+00	Compulsory	2	1
Course Objectives:	Bu ders, öğrencilerin, Türkiye'nin yakın tarihi hakkında bilgilendirilmesi amaçlanmaktadır. Bu bağlamda, öğrencileri, Türkiye Cumhuriyeti'nin kuruluş sürecine hakim olarak dönemin politik ve ekonomik gelişmeleri hakkında bilgi vermeyi amaçlamaktadır.					
Course Contents:	Cumhuriyet'in ilanından başlayarak çeşitli alanlarda gerçekleştirilen reformlar anlatılmaktadır.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Circuits Laboratory	EE 204	Spring	00+00+04	Compulsory	2	4
Course Objectives:	This course is designed to provide the students a solid understanding of (i) voltage, current and their measurements, (ii) behaviour of inductors and capacitors in alternative current circuits, and the concept of impedance, admittance and reactance, (iii) combinational circuit and counter design, and the operation of various circuit components in the laboratory environment.					
Course Contents:	Laboratory applications of circuit theory and digital design lecture components: Kirchoff's voltage and current laws. Thevenin-Norton equivalent circuits. Combinational circuits. Multiplexer-demultiplexer, encoder-decoder, flip-flops, registers, read only memory, digital arithmetic. Counter design. Voltage and current in AC circuits. Capacitance and inductance. Transients in RLC circuits. Impedance and admittance. Resonance.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Circuit Theory II	EE 222	Spring	03+00+00	Compulsory	3	6
Course Objectives:	To cover sinosoidal steady-state analysis and power calculations, to investigate networks with mutual inductance, to analyze series and parallel resonance circuits, to analyze circuits via Laplace transform, to study transfer function and 2-port circuits concepts.					
Course Contents:	Sinusoidal steady-state analysis and power calculations; mutual inductance; series and paralel resonance; Laplace transform in circuit analysis; transfer function and two-port circuits.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Electronic Circuit Components	EE 234	Spring	03+00+00	Compulsory	3	6
Course Objectives:	To provide a foundation for analyzing and designing analog and digital electronic circuits by learning the structure, operation, and low frequency characteristics of semiconductor devices.					
Course Contents:	Physics of semiconductors Semiconductor devices: diodes, transistors (BJT, JFET, MOSFET) structure, DC characteristics and use of semiconductor devices, BJT and FET amplifiers.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
English-IV	EL 202	Spring	03+00+00	Compulsory	3	4
Course Objectives:	READING By the end of the course, students will have developed their ability to cope with 550-1000 word texts on a variety of topics, especially authentic academic texts at high B2 level. It will provide opportunities to practise the skills developed in English Three. In addition, they will be able to: Identify function of the text annotating text, Read for general understanding : Considering section headings, Identify the main and supporting ideas, Identify the function of paragraphs, Identify word meaning from context, Develop ideas about the topics, Identify and summarize key points, Use research as evidence, Prepare notes to support a writer?s discussion, Scan the texts and select ideas, Select appropriate texts for paper, Make use of the texts: Simulate preparation for a presentation WRITING During this course students will get practice in the skills they have learnt in English One, English Two and English Three. By the end of the					

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	course, students will be able to synthesize these skills in order to: Write an extended essay using SPSIE (Situation, Problems, Solutions, Implications and Evaluation) approach and appropriate academic conventions, such as MLA or APA, The course will continue to reinforce the importance of avoiding plagiarism. SPEAKING By the end of the course, students will be able to: Express ideas and opinions in response to others using a variety of techniques and strategies in academic contexts, Initiate, participate in, contribute effectively and add to a discussion on a relevant academic topic in a classroom setting, Produce spontaneous spoken output					
Course Contents:	Unit 5: Food Security Unit 6: Human Resource Management Unit 7: Sustainable Fashion					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Calculus III	MA 208	Spring	03+00+00	Compulsory	3	6
Course Objectives:	1. To give a broad knowledge and basic understanding of multivariable functions, 2. To teach the concepts of limits, continuity and partial derivatives of multivariable functions 3. To help the students to demonstrate the ability to use the partial derivative concept in applications 4. To teach the integral calculus of multivariable functions and multiple integrals in the Cartesian, Cylindrical and Spherical Coordinate Systems. 5. To help the students to demonstrate the ability to use the multiple integrals in applications, 6. To teach the line integrals and Green?s Theorem in the plane , 7. To teach the Surface Integrals and Stoke?s and Divergence Theorems.					
Course Contents:	Multivariable Functions and Their Derivatives: Functions of several variables, limits and continuity , partial derivatives, chain rule, directional derivative, gradient vector and tangent plane, differentials, extreme values and saddle points, Lagrange multipliers, Taylor?s formula . Multiple Integrals: Double integrals, areas, double integrals in polar form, triple integrals in rectangular coordinates, triple integrals in Cylindrical and Spherical coordinates, substitutions in multiple integrals. Integration in Vector Field: Line integrals, vector fields, work, circulation, and flux, path independence of line integrals, potential function, and conservative fields, Green?s theorem in the plane, surface area and surface integrals, parametrized surfaces, Stoke?s theorem, Divergence theorem.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Internship I	MDBF 299	Fall	00+00+00	Compulsory	0	6
Course Objectives:	Building work experience., integrating theory and practice, exploring career alternatives .					
Course Contents:						
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Electronic Circuits	EE 331	Fall	03+00+00	Compulsory	3	6
Course Objectives:	To provide a solid understanding of the amplifier concept along with the high frequency limitations. The students will be familiar with the main building blocks of analog discrete/integrated circuits and they will be able to carry out the following steps in the design cycle: determination of the topology based on circuit specifications, estimating the component values, hand-calculation of basic performance metrics, verification and optimization by simulation.					
Course Contents:	Frequency response of amplifiers high frequency characteristics of transistors power amplifiers integrated circuit blocks: current sources, gain stages, differential pair, output stage multistage amplifiers and OPAMP feedback oscillators.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Electronic Circuits Laboratory I	EE 333	Fall	00+00+02	Compulsory	1	3
Course Objectives:	To obtain characteristics of basic electronic circuit components such as diode, zener diode, Bipolar Junction Transistors (BJT), Junction Field Effect Transistors (JFET), MOSFET, and operational amplifier (OPAMP). To analyze some applications of them.					
Course Contents:	Introduction to Semiconductor Junction Diodes & Characteristics, Semiconductor Junction Diode Applications, Analysis of Bipolar Junction Transistor (BJT), Common Emitter Transistor (BJT) Amplifier, BJT Amplifier Design, Analysis of Junction Field Effect Transistor (JFET), Common Source JFET Amplifier, MOSFET Amplifier, Properties of Operational Amplifiers, Application of Operational Amplifiers.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Electromagnetic Field Theory	EE 361	Fall	04+00+00	Compulsory	4	7
Course Objectives:	This course aims to introduce the students to the fundamental physical concepts of charges and the interaction between charges and currents. These concepts are electrostatics, magnetostatics and time-harmonic electromagnetics.					
Course Contents:	Overview of the electromagnetic (EM) model. Review of vector analysis. Static electric fields and the related fundamental postulates. Steady electric currents. Static magnetic fields. Time-varying fields and Maxwell's equations. Plane waves.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Signals and Systems	EE 371	Fall	03+00+00	Compulsory	3	6
Course Objectives:	This course deals with signals and systems from their theoretical mathematical foundations. By the end of the course, the students are expected to have a deep understanding of the mathematics and practical issues of signals in continuous- and discrete-time, linear time invariant systems, and their transform domain representations.					
Course Contents:	This course introduces continuous time (CT) and discrete time (DT) signals, signal transforms and signal processing systems with their properties and practical examples. The contents of this course include signal operations, convolution operation, Fourier, Laplace and z-transforms, and the introduction of the MATLAB software with some computer simulation examples.					

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Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Probability and Statistics for Engineers	GE 204	Spring	03+00+00	Compulsory	3	5
Course Objectives:	This course aims to introduce the students to the theory of probability and statistics, and its applications in order to provide some fundamental knowledge for the analysis of data in engineering systems.					
Course Contents:	In this course, data presentation and analysis, probability concepts, axioms of probability, random variables, mathematical expectations, discrete and continuous probability distributions, joint distributions, conditional probability, concepts of confidence interval and hypothesis testing, and applications related to probability and statistics are introduced.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Economics for Engineers	EC 309	Spring	03+00+00	Compulsory	3	4
Course Objectives:	1. To provide an engineering student the ability to use economic analysis in his/her engineering field. 2. To teach students the basic principles of microeconomics 3. To present students the general functioning of macroeconomics in relation to Turkish economy					
Course Contents:	Introduction to the principles of microeconomics; the fundamental problems of economies; the modeling of household and firm behaviors; market structures; the principles of public finance; the modeling of macroeconomics in an international context					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Electronic Circuits Laboratory II	EE 332	Spring	00+00+02	Compulsory	1	3
Course Objectives:	This course aims that students gain practical experience in building and testing of electronic circuits like amplifiers and oscillators. Furthermore, students will develop ability in comparing and presenting the results of theoretical, simulation and measurement results.					
Course Contents:	Experiments providing hands-on experience about amplifiers and oscillators are performed. Students carry out theoretical computations and simulations before the experiment. During the experiment, the circuits are built, and measurements are taken. Lastly, a report is prepared about the implementation of the experiment and the interpretation of the results					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Microprocessors	EE 342	Spring	02+00+02	Compulsory	3	5
Course Objectives:	To understand the basic operation of a microprocessors and microcontrollers and to learn fundamental programming skills in assembly and Arduino C/C++ languages					
Course Contents:	The course is designed to introduce students to assembly programming language, and basic interfacings of microprocessors. The course, also, includes the study of the microprocessor instruction set and the use assembly and C language programming for the Atmel Atmega328p microprocessor using Arduino.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Control Systems	EE 352	Spring	03+00+00	Compulsory	3	5
Course Objectives:	This course aims to introduce the students to the analysis of single-input single-output dynamic systems. Time-domain as well as frequency domain techniques are covered. The emphasis is on transfer function methods however, an introduction to state-space approach is also done.					
Course Contents:	Analysis of linear control systems by differential equations and transfer function methods using Laplace transforms. Stability of closed-loop systems. Routh-Hurwitz criterion. Root-locus diagrams. System analysis in frequency domain. Bode and polar plots. Nyquist stability criterion.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Digital Signal Processing	EE 374	Spring	03+00+00	Compulsory	3	5
Course Objectives:	This course aims to introduce the students the theory of discrete time systems as well as to teach them how to apply the theoretical knowledge gained to practical engineering problems.					
Course Contents:	Review of discrete-time signals and systems. Review of the z-transform. Sampling of continuous-time signals. Transform analysis of linear time-invariant systems. Structures for discrete-time systems. Filter design techniques.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Communication Systems	EE 376	Spring	03+00+02	Compulsory	4	5
Course Objectives:	1. Signal systems concepts in analog communications 2. Basic concepts on analog communications techniques 3. Design techniques of analog transmitters and receivers 4. Practical applications of analog communication systems in real life.					
Course Contents:	The course will cover the fundamentals of analog communications systems, more emphasizing on the analog signal processing and analog modülation techniques. The following topics will be covered in varying degrees of depth: 1. Elements of an analog electrıcal communıcatıon systems communication channels and their mathematical models. (Text book Section 1). 2. Frequency domaib analysis of signals in communications| power and energy density spectral density functions. (Text book Section 2). 3. Analog signal transmission and reception, Linear modulation techniques, amplitude modulation (AM), supressed carrier double side band modulation (SC-DSB), single side band (SSB) and vestigial side band (VSB) modulations. Modulators and demodulators 4. Nonlinear modulation techniques, frequency modulation (FM), phase modulation (PM). FM modulators and deodulators. (Text book Section 3). 5. Radio and television broadcasting techniques. (Text book Section 3).					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**

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Internship II	MDBF 399	Fall	00+00+00	Compulsory	0	6
Course Objectives:	Building work experience, integrating theory and practice, exploring career alternatives.					
Course Contents:						
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Engineering Problem Solving and Project Management	GE 401	Fall	02+00+00	Compulsory	2	6
Course Objectives:	The aim of the course is to give engineering students the basic definitions and nature of engineering problem solving along with the theory and application of the well-known methodologies. The course also covers the project management and related topics that will be very helpful for engineering students.					
Course Contents:	This course covers the following topics: definition of engineering problems, classification of open- and closed-ended problems, engineering design, conceptual design, embodiment design, detailed design, concurrent engineering, teamwork, human as a social entity in team works, project management, project proposal writing, innovation problem-solving.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Engineering Design Project	GE 400	Spring	00+08+00	Compulsory	4	10
Course Objectives:	In the design project course, students will find realistic solutions to open-ended engineering problems, and will lead to a product or model by using the knowledge gained from their undergraduate education.					
Course Contents:	A design project is the last stage of undergraduate education. An interdisciplinary project with a team of 2-4 students is carried out under the supervision of one or more faculty members. The faculty assignment, the proposal dates and the final report submission along with the defense dates are announced before the semester begins.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Sensor Networks	EE 402	Spring	03+00+00	Elective	3	8
Course Objectives:	At the completion of this course, students will be able to: • Know the basics and challenges of wireless networking • Understand the constraints of wireless sensor networks • Design protocols to meet the challenges and constraints of a specific application					
Course Contents:	The aim of this course is to build a foundation for wireless sensor networks with a particular focus on protocols. The course starts with an introduction on applications, single node and network architecture of wireless sensor networks. Then the course presents the challenges in networking at multiple protocol layers considering the special constraints of sensor networks and methods that can be applied to the design of the communication protocols. The course also includes multiple extra lectures on WSN Programming, Internet of Things and Machine-to-Machine Communications.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Communication Electronics	EE 431	Spring	03+00+00	Elective	3	8
Course Objectives:	To study the circuits in amplitude and frequency modulated transmitters and receivers.					
Course Contents:	Amplitude and frequency modulated transmitters and receivers; their working principles.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Analog Design	EE 435	Fall	03+00+02	Elective	4	10
Course Objectives:	The students will be able to analyze and design basic analog circuits, use data sheets effectively for predicting circuit performance in the analysis phase and for component selection in the design phase, identify circuit limitations and predict non-idealities in the design, carry out the following steps in the design cycle: determination of the circuit topology based on requirements and constraints, selection of integrated circuit components, estimating the component values, hand-calculation of basic performance metrics.					
Course Contents:	Operational amplifiers, circuits with feedback, linear and nonlinear op-amp circuits, current to voltage, voltage to current converters, active filters, voltage comparators, signal generators, voltage regulators.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Industrial Electronics	EE 438	Fall	03+00+00	Elective	3	8
Course Objectives:	The purpose of this course is to provide some industrial applications to the students.					
Course Contents:	Basic electronics components: Diodes, UJT, SCR, diac, triac. Electronic control of motors. Servomechanism and synchronization. Closed loop control. Induction and dielectric heating. DC-DC converters, inverters (DC-AC). Uninterruptible power supplies and switching power supplies.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Wireless Communications	EE 444	Spring	03+00+00	Elective	3	8
Course Objectives:	At the completion of this course, students will be able to: • Describe and characterize fading multipath wireless radio channels and explain the effects of fading multi-path channels on the link performance of wireless communication systems • Provide possible solutions and					

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	techniques to the problem of signal fading in wireless commu- nication links • Analyze simple wireless networks in terms of coverage and capacity • Discuss the details of multiuser systems and networks					
Course Contents:	The aim of this course is to introduce the fundamental models and techniques used in the opera- tion of wireless communication systems such as channel models, channel capacity, diversity, OFDM, CDMA, multiple antenna systems and multiuser systems.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Microwave Engineering	EE 446	Fall	03+00+00	Elective	3	8
Course Objectives:	To cover the fundamentals of transmission line theory, to calculate two-port parameters, to learn how to design matching networks via Smith Chart or analytically and to learn how to design filters and amplifiers.					
Course Contents:	Transmission line theory; microwave network analysis; impedance matching; Smith chart; filter and amplifier design.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Electrical Machines	EE 461	Fall	03+00+00	Elective	3	8
Course Objectives:	To learn the principles of electromechanical energy conversion and to use these principles to understand the operation principles, applications, and control methods of transformers, dc, and ac machines.					
Course Contents:	Active and reactive power. Single-phase and three-phase systems. Electromagnetic circuits. Electromechanical energy conversion. Transformers. DC motors: principles of operation, speed control. Synchronous machines: equivalent circuit, performance analysis, synchronization. Induction motors: principles of operation, equivalent circuit, speed control. Brushless DC Motors and Permanent Magnet AC Motors. Electric drives.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Power System Analysis	EE 464	Spring	03+00+00	Elective	3	8
Course Objectives:	To learn about the concepts and tools, which are necessary to analyze power systems and utilization of these tools.					
Course Contents:	Structure and components of power systems. Single-phase and three-phase systems. Power Transformers. Transmission line parameters. Line models. Power flow calculations. Symmetrical and non-symmetrical faults. Symmetrical components. Power system stability. Control in power systems.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Digital Communication	EE 473	Fall	03+00+02	Elective	4	10
Course Objectives:	1. Basic concepts on digital communications 2. Design of digital communication systems using MATLAB 3. Investigation of Bit Error Rate performances					
Course Contents:	Course: The course will cover the fundamentals of communication theory more emphasizing on random signals and digital communication systems. The following topics will be covered in varying degrees of depth: 1. Random Processes and applıcations to the communication systems. 2. Digital communnicationos over band limited channels . 3. Passband Digital Transmission, Digital modulation Techniques, ASK, FSK, PSK, QAM types of modulations, Digital receiver designs. Laboratory: Using MATLAB software the block diagrams of several digital communications systems will be implemented and their bit error performances will be analyzed					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Mobile Communication	EE 476	Fall	03+00+00	Elective	3	8
Course Objectives:	Understanding of the principles of mobile communication systems analysis and design of its components					
Course Contents:	Principles of communications, mobile communication, types of modulation, design of communication systems, simulations.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Simulation of Communication Systems	EE 479	Fall	03+00+00	Elective	3	8
Course Objectives:	Gain a stronger technical understanding of communication systems. Combine theory with a practical system-level perspective to evaluate and specify subsystem technologies. Participate in class-simulation exercises, and examine numerous examples of advanced communication systems.					
Course Contents:	Role of simulation in communication systems engineering, simulation approaches and methodologies, filter models, noise generation, Monte-Carlo simulation, hands-on examples including integration of digital communications, channel modelling, coding and elementary statistical estimation tecniques.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Wireless Communication Networks	EE 483	Fall	03+00+00	Elective	3	8
Course Objectives:	At the completion of this course, students will be able to: • Comprehend the basics of data and packet communications • Understand the fundamentals of wireless communication technology • Describe and explain the details of wireless local and personal area networks • Know the details of wireless mobile networks and applications					
Course Contents:	The aim of this course is to build a foundation for wireless communication networks. The course starts with a technical background including the process of data and packet communications and wireless communication technology. Then the course presents the wireless					

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	local and personal area networks with details on IEEE 802.11, IEEE 802.15, Bluetooth and Zigbee. The course also covers mobile cellular systems, LTE, mobile applications and long range communications using satellite and WiMax.					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Radar ve Sensör Sistemleri	EE 485	Fall	03+00+00	Elective	3	8
Course Objectives:	To understand the principles of radars and sensors, and to learn their practical applications					
Course Contents:	To be determined					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Fiber Optical Communication	EE 486	Fall	03+00+00	Elective	3	8
Course Objectives:	To learn the technical details of fiber optical communications					
Course Contents:	To be determined					
Course Name	**Code**	**Semester**	**T+A+L (hour/week)**	**Type (C / O)**	**Local Credit**	**ECTS**
Computational Intelligence	EE 491	Fall	03+00+00	Elective	3	8
Course Objectives:	To provide a foundation for concepts, models, algorithms, and tools for design and development of intelligent systems					
Course Contents:	Computational intelligence, neural networks, evolutionary computation, genetic algorithms, fuzzy systems					

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