

ELECTRICAL - ELECTRONICS ENGINEERING FOR STUDENTS WHO START THEIR EDUCATION IN DEPARTMENT AFTER 2019-2020 ACADEMIC YEAR FALL SEMESTER						
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Origins and Consequences	KHAS 101	Fall	03+00+00	Compulsory	3	5
Course Objectives:	This course aims to introduce the students with a broad outline on fundamental sciences by focusing on a discussion of groundbreaking discoveries, innovations and inventions in various scientific fields. The course also aims to develop the students' curiosity for scientific fields and their connections, help them understand the consequences of scientific developments and the role science and technology play in shaping today's world.					
Course Contents:	The course explores groundbreaking discoveries / innovations / inventions in astronomy, geoscience, biology, chemistry, physics and technology, and provides the students with a background in science and today's world.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
History of Humankind	KHAS 103	Fall	03+00+00	Compulsory	3	5
Course Objectives:	The main objective of this course is to introduce the students with major concepts in humanities and social sciences as they relate to world civilizations and history. It is expected that the students will become familiar with social scientific theories that utilize and build upon these concepts and understand that concepts and ideas change in time and space, and are institutionally framed. The course also aims to help the students develop their capacities for critical thinking and analysis; learn ways of reading (primary) texts and expressing arguments and ideas verbally, visually, and in writing; and develop intellectual responsibility and respect for others.					
Course Contents:	This course focuses on the content and social context of concepts such as civilization, science, history, time, space, myth, religion, individual, society, family, state, nation, race, gender, culture, globalization, which the students will encounter in their four years of university education. Following a quasi-chronology, the course will enable the students to understand the historical context and intellectual conditions that give rise to certain developments. The overarching theme will be how we understand civilization and the implications of different notions of civilization on how we interpret the world around us and how we organize our everyday practices. The course will cover the period from the beginnings of the world, as depicted in scientific, religious, and mythical origin stories to the times of colonialisms and revolutions up until early twentieth century. Throughout the term the students will read primary or secondary texts and watch documentary and/or feature films dealing with history, family, religion, city, and/or nation, and respond to them utilizing the concepts covered in class.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Universal Values and Ethics	KHAS 105	Fall	03+00+00	Compulsory	3	5
Course Objectives:	This transdisciplinary course is designed to help students reflect critically on the ethical implications of their conceptions of life and of their relationship with other human beings, with the society at large, and with the rest of existence. It aims to encourage them to think freely - to be free of prejudice and misinformed preconceptions; to build self-confidence and become responsible individuals who appreciate the rights of other living beings; and to empower them to become active agents in society's development through civic engagement. The course also aims to equip the students with basic research skills and reinforce their command of English by developing their reading, writing, listening, and speaking skills, and to expand students' academic vocabulary both at the receptive and productive level.					
Course Contents:	The course consists of five modules designed to focus on some of the most pressing issues of our times, i.e. diversity, citizenship, gender, information technologies, and bioethics, all of which involve ethical dilemmas that are hard to resolve and even hard to recognize most of the time. Rather than equipping the students with normative moral values that would supposedly guide them in such situations, the course emphasizes the ability to evaluate issues with empathy, to think and analyze contextually and relationally, and, most importantly, with the ability to see tones of grey in ethical matters, and to recognize that their personal views and choices may have broader implications that go well beyond their immediate consequences.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Design	KHAS 107	Fall	03+00+00	Compulsory	3	5
Course Objectives:	This course aims to introduce the students to the wide world of design and its change-inducing mindset through a variety of perspectives and examples by forming links with the concepts of creativity, innovation, problem-defining and solving, intellectual sensibility, viable improvement and sustainability. The course presents design in an expanded scope including technical/technological, material, spatial, ecological, political, economic, and global perspectives. It presents a rich variety of works in various scales blurring the boundaries between design, arts, architecture, engineering, science, business and many other fields in which design-thinking can be implemented and can exert large-scale impact and positive change. Seeing students as creative individuals and parts of a creative community, the course also aims to foster team work and acute communication (verbal, written and visual) along with the skills of project management, presentation and storytelling.					
Course Contents:	<p>The course comprises of 4 main modules concentrating on different aspects, stages and implementations of design-thinking in relation to various fields, complemented by a following workshop (studio) session of 5 weeks engaging students to work in interdisciplinary teams and in a design project of their own devising which will also be tutored by a respective mentor.</p> <p>1. Understanding the nature and power of design-thinking and doing: The module will concentrate on the fundamentals, values and purposes vested in design-thinking in general. Students will be introduced to the impact and place of design in everyday life, culture, history and many contemporary fields – all in relation with the concepts and practices of creative-thinking, innovation, human-centered design and social change.</p> <p>2. Stories of Design: As a more expanded episode to the previous module, students will be introduced various inspirational cases from various fields (architecture, product / UX design, engineering, business, health, non-profit projects etc.) directly by the stories told by the makers and organizers of these respective examples.</p> <p>3. Problem-Defining, Field-Research, Analysis and Visualization:</p>					

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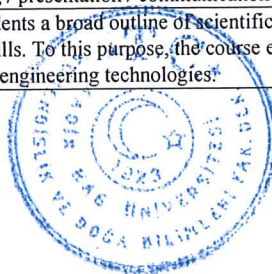



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	<p>The module will be focusing on the initial and vital stages of design-thinking. Students will be introduced to the preliminary preparations and necessary perspectives in setting up a design-project as well as conducting it further. Various tools and modes of research, problem-defining, analysis, ideation and effective visualization will also be introduced through examples and small assignments.</p> <p>4. Prototyping, Testing and Iteration:</p> <p>The final module, expanding on the concepts and stages introduced in the previous one, will be centered on the methods and means of devising the design work through modelling, testing and further iterative development through its finalization. This and the third module will also be following the main stages in design-thinking, and will include small assignments for each phase in a way that corresponds with the following workshop session which will proceed in a similar, stage-by-stage fashion.</p> <p>PROJECT WORKSHOPS:</p> <p>In this 5-week phase, students will shape and conduct a design project of their own, working in teams and with the mentorship of a tutor, and will experience the design process in a customized fashion resulting a final work that aims to meet the needs of the end-user or the intended social impact.</p> <p>a. Defining problem & needs, market / field / user identification and specifying requirements b. Concept design / Ideation c. Design Specifics & Development d. Modelling / Production e. Testing & Feedback f. Documentation</p>					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Computational Thinking	KHAS 109	Fall	03+00+00	Compulsory	3	5
Course Objectives:	<p>This course aims to present an applied introduction to algorithmic thinking for complex problem solving tasks. It seeks to build up a wide variety of interdisciplinary problem and conflict-resolution skills and competencies derived from computation, mathematics, logic and design. It introduces a multitude of problem solving skills such as pattern recognition, abstraction, induction-deduction that students will work on in groups, as well as preparing students to use programming interfaces like Python to work with datasets to address popular and exciting riddles and problems. Overall, the course prepares students for the rest of their university life and the problems they may encounter throughout.</p>					
Course Contents:	<ul style="list-style-type: none"> • Critical Thinking and Logical Reasoning • Deduction and Induction • Computational Thinking and its 4 pillars: Problem Decomposition • Pattern Recognition • Abstraction • Fun with Algorithms • Algorithms and Procedures • Data Collection • Data Analysis • Data Representation / Presentation 					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Critical Reading and Writing in Turkish I	TLL 101	Fall	02+00+00	Compulsory	2	3
Course Objectives:	<p>This course aims to develop skills to express themselves orally and in writing in daily life and to comprehend argumentative essays in various forms and analyze them critically. This course encourages students to express their thoughts / arguments individually or as a member of a group in accordance with the manners of discussion. In this course students gain the ability to use relevant materials and resources in conducting academic research and the reflex to apply the rules of academic integrity in written and oral productions.</p>					
Course Contents:	<p>Critical Reading and Writing in Turkish I is designed each week as a 2-hour reading and writing workshop in order to improve students' reading and writing skills in Turkish and to develop their critical thinking and ensure to express their thoughts in a proper, comprehensible and fluent Turkish. In the course, students are encouraged to express themselves individually or in a group work, verbally and in written form in daily life, to read and understand critically argumentative essays, to be able to produce arguments and conduct academic research on a particular subject using relevant sources. The course is also designed to raise awareness in terms of academic integrity among the students.</p>					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Fundamentals of Electrical-Electronics Engineering	EEE 102	Spring	02+00+02	Compulsory	3	5
Course Objectives:	<p>The aim of the course is to examine the basic topics of Electrical and Electronics Engineering.</p>					
Course Contents:	<p>Physical dimensions; measurement and modeling; electrical quantities (a charge, current, voltage); electric and magnetic fields; electrical materials: conductors, semiconductors, isolators; electrical components in daily life: resistance, capacitance, inductance.</p>					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Scientific Discoveries and Engineering	KHAS 102	Spring	03+00+00	Compulsory	3	5
Course Objectives:	<p>The course aims to help students gain ability to define engineering problems within their context and to develop curiosity for scientific fields and their interconnections. In this course, students also can reflect on the significance of bearing multiple viewpoints in producing, understanding, and utilizing scientific knowledge. Additionally, students learn to take responsibility for professional development and improve their academic reading / writing / presentation / communication skills in English.</p>					
Course Contents:	<p>The goal of this course is to provide students a broad outline of scientific discoveries and engineering, and help them to develop their critical thinking and problem-solving skills. To this purpose, the course explores different disciplines of engineering and provides participants with a broad background of engineering technologies.</p>					

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Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Civic Responsibility Project	KHAS 110	Spring	00+02+00	Compulsory	1	2
Course Objectives:	This course introduces students to the concept of social responsibility with theoretical knowledge and universal values. It aims to transform this information into active citizenship skills through civic engagement activities.					
Course Contents:	This course introduces civic engagement and active citizenship concepts within the framework of social responsibility. The course presents basic knowledge and understanding in the field of social responsibility theoretically. Additionally, the course also allows the students to design and implement a project to develop their skills of realizing problems of the society they live in and developing solutions for these problems.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Thinking Mathematically	KHAS 112	Spring	03+00+00	Compulsory	4	6
Course Objectives:	The goal of this course is to cover basic concepts of mathematics that will be of use to the students of any background using a modular teaching model. Students will be able to identify solution strategies for real-life problems and comprehend the need for mathematical tools. Mathematical concepts will be discovered/thought through experiments hence the student will be able to observe the need for mathematics.					
Course Contents:	-Joy of Numbers (Introduction Module) -Uncertainty in Life (Module 1) -Finding Trends in Everyday Life (Module 2) -Rate of Change (Module 3) -Areas and Volumes (Module 4) -Abstract Thinking (Module 5)					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Robotics Start-Up Project	MTE 192	Spring	02+02+00	Compulsory	3	6
Course Objectives:	Introducing students to the basic hardware, software and sensor elements that are used in mechatronics engineering. Students will develop hands-on experience related to such components, while carrying out a project and doing activities during the preparation stage.					
Course Contents:	Physical building of a robot, programming of robot components, designing and creating the circuitry required for communication between software and hardware					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Critical Reading and Writing in Turkish II	TLL 102	Spring	02+00+00	Compulsory	2	3
Course Objectives:	The course aims to define the elements of fiction (novel and short story) such as character, plot, point of view, description, time, space etc. and to interpret and criticize Turkish novels and short stories in an analytical way. Additionally, the course enable students to write critical articles on fiction using secondary sources and to develop their skills on storytelling/depiction/editing with short creative writing studies. The course also aims to explore the various relationships of novel and short story with different genres through concepts such as intertextuality, adaptation and rewriting.					
Course Contents:	The content of the course is based on the genres, novel and short stories. Focusing on the concept of "fiction" through novels and short stories in modern Turkish literature, students will be able to interpret and criticize novels and stories in an analytical way and produce their own critical points of view. In addition, the relationship between novels and short stories with other texts and genres is discussed through concepts such as intertextuality, adaptation and rewriting. Besides, in-class activities are designed in order to encourage the creative writing skills of students.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Circuit Analysis I	EEE 203	Fall	03+00+02	Compulsory	4	5
Course Objectives:	The aim of the course is to examine fundamental circuit variables, fundamental circuit components, circuit analysis techniques, RL, RC, RLC circuit responses, and operational amplifiers.					
Course Contents:	Circuit variables; circuit elements; simple resistive circuits; techniques of circuit analysis; operational amplifier and applications; analysis of circuits with 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
Tools for Electrical-Electronics Engineering	EEE 207	Fall	01+00+04	Compulsory	3	6
Course Objectives:	To provide a hands-on experience in computer tools that are essential for electrical-electronics engineering					
Course Contents:	MATLAB: variables, conditional statements, loops, functions, recursion, plotting, graphical and numerical analysis.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Applied Engineering Mathematics I	FENS 201	Fall	03+02+00	Compulsory	4	6
Course Objectives:	The aim of this course is to provide the mathematical background (derivatives, integrals, linear systems of equations, linear differential equations) necessary for engineering applications.					
Course Contents:	• Engineering applications of differentiation and integration • First-order ordinary differential equations and their applications • Linear systems of equations • Higher-order ordinary differential equations					

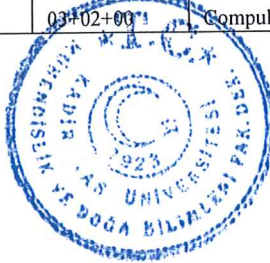
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Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Materials	FENS 203	Fall	03+00+00	Compulsory	3	4
Course Objectives:						
Course Contents:						
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
History of Modern Turkey I	HST 101	Fall	02+00+00	Compulsory	2	2
Course Objectives:	The main objective of this course is to introduce students major themes and events in the history of modern Turkey with a focus on the modernization process during the Ottoman era. Students will become familiar with the major issues in the modernization process of Turkey through a variety of sources, including archival, visual, and fictional ones. It is expected that students will be able to develop critical thinking and historical perspective to analyze current social, political and economic developments.					
Course Contents:	This course explores the modernization process in the Ottoman Empire and how those transformations were reflected in the making of modern Turkey. Although there is a chronological frame, the course is organized as modules focusing on certain themes. Throughout six modules, modernization of the state apparatus, integration to the global economy, transformation of the cities, modern forms of art and changes in social life will be discussed. Students will become familiar with the political reforms of the late Ottoman period, Ottoman political and intellectual figures of the modern era, changes in social structure with the process of modernization, demographic structure of the cities, urban planning, cultural life and lastly wars which triggered change in various areas. These topics will be covered through the primary and secondary sources.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Logic Design	MTE 293	Fall	03+00+02	Compulsory	4	8
Course Objectives:	This course aims to introduce Boolean algebra and basic analysis and synthesis techniques for logic circuits in a project-based context. Both combinational and sequential circuits are covered in various design examples.					
Course Contents:	Number systems; Boolean algebra; logic networks and their simplification; logic design techniques with gates and MSI chips; combinational circuits; basic sequential circuits; D/A and A/D conversion; design examples.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Circuit Analysis II	EEE 204	Spring	03+00+02	Compulsory	4	5
Course Objectives:	The aim of the course is to examine sinusoidal 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 parallel resonance; Laplace transforms in circuit analysis; transfer function; two-port circuits.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Programming	EEE 206	Spring	02+00+02	Compulsory	3	4
Course Objectives:	The aim of this course is to provide the students with the knowledge of computing, algorithms, data structures, programming with Python, program design, and problem-solving skills.					
Course Contents:	Software and hardware concepts, problem-solving using algorithms, Python programming language properties, input-output operations, variable concept and types, arithmetic operators, conditional operators, logical operators, loop operators, collections, introduction to functions, and recursive functions.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Electronics Design Project	EEE 208	Spring	01+00+04	Compulsory	3	7
Course Objectives:	To provide a solid understanding and practical skills in the electronic design and manufacturing processes.					
Course Contents:	Design and production steps for a product: need and market analysis, conceptual design, circuit design, simulation, prototyping, printed circuit board design, printed circuit board production, assembly, casing, test, troubleshooting, user's manual. Example projects: power supply, time-delayed on-off control using transistors, counter for objects passing.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Internship I	EEE 299	Spring	00+00+00	Compulsory	0	5
Course Objectives:	The aim of this course is to engage second year engineering students in real-life work and employment conditions to acquire hands-on experience and have the chance to practice with the knowledge and skills gained in the Electrical-Electronics engineering undergraduate program for a total of 40 work days / 8 weeks in professional environment.					
Course Contents:	Responsibilities and workload assigned by the company.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Applied Engineering Mathematics II	FENS 202	Spring	03+02+00	Compulsory	4	6

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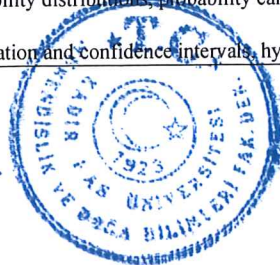



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Course Objectives:	The aim of this course is to provide mathematical background on functions of many variables (partial derivatives, gradient fields, optimization; divergence, curl; volume and surface integrals, special topics on differential equations) necessary for engineering applications.					
Course Contents:	• Functions of many variables, partial derivatives, optimization • Gradient, divergence, and curl and their applications • Surface and volume integrals and their applications • Advanced topics in differential equations					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
History of Modern Turkey II	HST 102	Spring	02+00+00	Compulsory	2	2
Course Objectives:	The main objective of this course is to introduce the students major themes and events in the history of modern Turkey. Students will learn about different perspectives about the major issues of Turkey through a variety of sources, including archival, visual, and fictional ones. The course aims to help students in situating Turkey in a global context besides realizing the pluralistic nature of the history of Turkey. In the end, the course is intended to make students informed and questioning citizens.					
Course Contents:	This course explores the history of modern Turkey from the early Republican period until today in its political, social, economic, and cultural aspects. Following a module-based structure based on specific themes, the course centers on the ruptures and continuities in general trends and processes of the history of Turkey. Throughout six modules, the shifts from empire to Republic, a single-party system to a multi-party system, the Cold War to the new global world will be discussed in relation to various social and economic aspects including rural to urban migration, social movements, neoliberalism, political Islam and identity politics. In this regard, the class is planned on three principles: First, it places Turkey in a global context hence emphasizes connections as well as disconnections. Second, it evaluates both the transformations at the state level and how 'ordinary' people are influenced by those transformations. Third, besides secondary guiding sources, primary sources are used to help students relate in a personal way to the past and promote a deeper understanding of history instead of a series of events.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Electronics I	EEE 303	Fall	03+00+02	Compulsory	4	5
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. Module projects: Diodes and Applications, Bipolar Transistors, Bipolar Transistor Amplifier, BJT Amplifier Design, Field-Effect Transistors					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Microcontrollers	EEE 305	Fall	02+00+02	Compulsory	3	5
Course Objectives:	The aim of the course is to examine the basic interfaces of microcontrollers and also to explain the programming of Arduino microcontroller with assembly and C language by using various hardware elements and sensors and to make applications related to them.					
Course Contents:	Components of microprocessors and microcontrollers, microcontroller development board and technical specs, microcontroller programming, debugging and verification using a simulator and microcontroller, input/output using switches, LEDs, motors and serial ports, analog to digital conversion, sampling, simple motors, motor speed control, computer memory, load/store operations, registers, assembly language, addressing modes, ports, code instruction format and opcode.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Signals and Systems	EEE 307	Fall	02+00+02	Compulsory	3	5
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 active use of MATLAB software in projects.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Software-Hardware Integration Project	EEE 309	Fall	01+00+04	Compulsory	3	8
Course Objectives:	To provide a foundation for concepts and tools for the integration of hardware and software components for the design and development of complex systems.					
Course Contents:	Software and microcontroller based system (e.g. oscilloscope or spectrum analyzer) design and implementation; analog signals; digital signals; sampling theorem; fundamentals of analog-to-digital and digital-to-analog converters; microcontroller-based data acquisition systems; fast Fourier transform; graphical user interface design.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Probability and Statistics	FENS 200	Fall	02+02+00	Compulsory	3	4
Course Objectives:	The aim of this course is to introduce students to probability and statistical theory and applications and provide some basic information necessary for data analysis in engineering systems.					
Course Contents:	Module 1: Data presentations and analysis, probability concepts and probability axioms, random variables, mathematical averages Module 2: Discrete and continuous probability distributions, probability calculations, common distributions, conditional probability and independence Module 3: Probability distributions, estimation and confidence intervals, hypothesis testing					

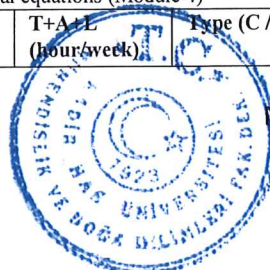
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	Module 4: Experimental design Module 5: Risk and reliability concepts					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Communications I	EEE 302	Spring	03+00+02	Compulsory	4	5
Course Objectives:	1. Signal systems concepts 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 modulation techniques. The following topics will be covered in varying degrees of depth: 1. Elements of an analog electrical communication systems communication channels and their mathematical models. 2. Frequency domain analysis of signals in communications, power and energy density spectral density functions. 3. Analog signal transmission and reception, Linear modulation techniques, amplitude modulation (AM), suppressed 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 demodulators. 5. Radio and television broadcasting techniques.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Electronics II	EEE 304	Spring	03+00+02	Compulsory	4	5
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. To gain practical experience in building and testing of electronic circuits.					
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. Module projects: Amplifiers, frequency response, feedback, oscillators, OPAMP, experiment design.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Electromagnetics	EEE 306	Spring	03+00+00	Compulsory	3	5
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
Control Systems Project	EEE 308	Spring	01+00+04	Compulsory	3	8
Course Objectives:	To provide solid understanding and practical skills in the design of communication systems.					
Course Contents:	Design and production steps for a product: Need and market analysis, conceptual design, simulation, circuit design, testing, troubleshooting. Example projects: Design of 90 degree phase shifter, Amplitude modulation (AM), Double side band suppress carrier (DSB-SC) and Single side band (SSB) transmitter and receiver circuit design; Generation of signal waveforms in analog communications; FM transmitter and receiver circuit design; Implementation of the QPSK transmitter and receiver; Design of wireless audio transmitter for TV; Design of wireless mobile battery charger circuit; Wireless message communication between two computers; Design of RF secure coded communication system					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Internship II	EEE 399	Spring	00+00+00	Compulsory	0	5
Course Objectives:	The aim of this course is to engage third year engineering students in real-life work and employment conditions to acquire hands-on experience and have the chance to practice with the knowledge and skills gained in the Electrical-Electronics engineering undergraduate program for a total of 40 work days / 8 weeks in professional environment.					
Course Contents:	Responsibilities and workload assigned by the company.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Numerical Methods	FENS 300	Spring	02+02+00	Compulsory	3	5
Course Objectives:	This course aims to introduce students to mathematics, logic and language of numerical methods as used in engineering and basic sciences. Students will learn how numerical methods are applied to important problems in science and engineering.					
Course Contents:	Describe numerical methods and their applications in engineering, error analysis of numerical methods, analytical solutions (Module 1) Numerical methods for solving linear and nonlinear equation systems (Module 2) Approximation methods, interpolation, linear regression, numerical integration (Module 3) Numerical methods for solutions of differential equations (Module 4)					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS

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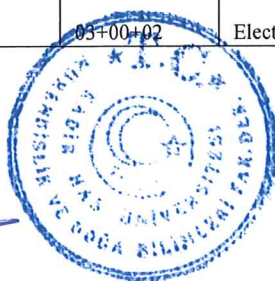



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Engineering Design Project I	FENS 401	Fall	01+02+00	Compulsory	2	6
Course Objectives:	The aim of the course is to give engineering students the basic definitions and nature of engineering problem solving along with the theory and application of the 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
Innovation and Entrepreneurship	EEE 406	Spring	02+00+00	Compulsory	2	3
Course Objectives:	To create awareness in innovation and entrepreneurship so that students will be informed about the opportunities and risks of entrepreneurship.					
Course Contents:	Innovation as a process; entrepreneurship: opportunities and risks; idea generation; product development; business plan; funding resources; intellectual property; project work including mentoring: team forming, ideation, business model formation, commercialization strategy, product-service development and launch, customer acquisition, investment seeking					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Engineering Design Project II	FENS 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
Analog Design Project	EEE 403	Fall	01+00+04	Elective	3	8
Course Objectives:	Students will be able to analyze and design analog circuits. Students will be able to identify constraints and non-ideal situations in design. They will also be able to identify circuit topology, select integrated circuits to be used, determine approximate circuit element values, and overcome some simple performance calculations, taking into account constraints and needs.					
Course Contents:	Basics of amplifiers, op-amp circuit analysis, current to voltage converters, voltage to current converters, current amplifiers, first order active filters, second order KRC and multiple feedback active filters, voltage comparators, Schmitt triggers, signal generators.					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Computational Intelligence Project	EEE 405	Fall	01+00+04	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, machine learning, neural networks, genetic algorithms, fuzzy systems, project. (e.g. maze solving for robots, 5G traffic analysis, and anomaly detection)					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Wireless Networks Project	EEE 407	Fall	01+00+04	Elective	3	8
Course Objectives:	The aim of this course is to complete a project on wireless networks under the supervision of the instructor.					
Course Contents:	Topics: Wireless channel, signal encoding, OFDM, spread spectrum, local area networks, personal area networks, wireless mobile networks, cellular networks, next generation networks. Projects: Designing a Wireless Communication Network from Scratch, Modeling and Simulation of 5G Machine-to-Machine Traffic, Modeling and Simulation of 5G Human-to-Human Traffic, IoT Human Body Networks, Application of Machine Learning in Wireless Networks, Designing a Vehicle-to-Vehicle Communication Protocol					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Communication Project	EEE 409	Fall	01+00+04	Elective	3	8
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
Communications II	EEE 411	Fall	03+00+02	Elective	4	5

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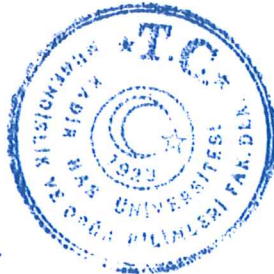



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Course Objectives:	1. Basic concepts on digital communications 2. Design of digital communication systems using MATLAB 3. Investigation of bit error rate performances					
Course Contents:	Topics: Random processes and applications to the communication systems, digital communications over band limited channels, passband digital transmission, digital modulation techniques, ASK, FSK, PSK, QAM types of modulations, digital receiver design, bit error rate analysis. Projects: Baseband vs. Passband Transmission, Digital Modulation Schemes (ASK, FSK, PSK, QAM), Digital Receiver Design, Bit Error Rate Analysis					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Digital Signal Processing	EEE 412	Fall	03+00+02	Elective	4	5
Course Objectives:	This course aims to introduce the students to the theory of discrete-time systems as well as to teach them how to perform signal processing in practical engineering problems.					
Course Contents:	Review of discrete-time signals and systems. Review of the z-transform. A 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
Sensor Networks	EEE 413	Fall	03+00+02	Elective	4	5
Course Objectives:	The aim of this course is to build a foundation for wireless sensor networks with a particular focus on protocols.					
Course Contents:	Topics: Wireless sensor network applications, single node and network architecture, the challenges in networking at multiple protocol layers considering the special constraints of sensor networks (physical layer, MAC layer, routing layer), time synchronization, localization and positioning, topology control. Projects: Intravehicular Wireless Sensor Networks, Energy Harvesting based Wireless Sensor Networks, Integrating Sensors to 5G Cellular Networks, 2-Layer (PHY, MAC) Joint Protocol Design for Sensor Networks, Robust Localization in Sensor Networks					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
Wireless Communications	EEE 414	Fall	03+00+02	Elective	4	5
Course Objectives:	The aim of this course is to introduce the fundamental models and techniques used in the operation of wireless communication systems.					
Course Contents:	Topics: Wireless channel models, channel capacity, diversity, OFDM, CDMA, multiple antenna systems and multiuser systems. Projects: PHY Layer Security Project, Implementation of Nonorthogonal Waveforms, Implementation of Flexible Numerology PHY Layer Architecture, Multipath Channel Modeling in University Laboratories					
Course Name	Code	Semester	T+A+L (hour/week)	Type (C / O)	Local Credit	ECTS
High Frequency Circuits	EEE 415	Fall	03+00+02	Elective	4	5
Course Objectives:	The aim of the course is to examine the fundamentals of transmission line theory, to analyze microwave networks via 2-port parameters, to learn how to design microwave matching networks via Smith Charts or analytically, and to learn how to design microwave filters.					
Course Contents:	Introduction to antennae; transmission line theory; microwave network analysis; impedance matching and tuning; Smith Chart; microwave filter design.					

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