First Semester

EEE 101 Physics I (3-0-1) Local Credits:5 ECTS:5

Vectors; kinematics; particle dynamics work and energy; conservation of energy; system of particles; collisions; rotational motion; oscillations.

EEE 103 Chemistry (3-0-0) Local Credits:4 ECTS:4

Introduction to atomic and electronic structure, chemical bonding, molecular structure and bonding theories, properties of liquids, solids and solutions, chemical equilibrium, kinetics, thermodynamics, metal complexes, organic compounds and nuclear chemistry.

EEE 105 Mathematics I (4-0-0) Local Credits:5 ECTS:5

Functions of a Single Variable, Limits and Continuity, Derivatives, Applications of Derivatives, Sketching Graphs of Functions, Asymptotes, Integration, Fundamental Theorem of Calculus, Applications of Integrals, Polar Coordinates, Transcendental Functions, Techniques of Integration, Indeterminate Forms, L'Hopital's Rule.

EEE 107 C Programming (3-0-2) Local Credits:5 ECTS:5

The course aims to introduce students basic programming and to give them the ability to solve some simple problems using C programming language.

EEE 109 Computer Tools for Electrical Engineering (3-0-2) Local Credits:5 ECTS:5

Matlab variables, scripts, and operations, Visualization and programming, Data presentation and analysis approaches, Built-in Functions, User-defined functions, Plotting in Matlab, Logical functions and Selection structures, Repetition structures, Matrix manipulations.

YDE 101 Foreign Language I (Effective Communication Skills) (3-0-0) Local Credits:4 ECTS:4

This course aims to further students' oral communication skills in English that they have acquired in the previous courses.

SEC 101 ELECTIVE COURSE I (OUT OF AREA)* (2-0-0) Local Credits:2 ECTS:2

Second Semester

EEE 102 Physics II (3-0-1) Local Credits:5 ECTS:5

Electric charge; electric field; Gauss` law, electric potential; capacitance; current and resistance; circuits; magnetic field; Ampere`s law; Faraday`s law of induction; electro-magnetic oscillations; alternating currents.

EEE104 Mathematics II (4-0-0) Local Credits:5 ECTS:5

Improper İntegrals, Infinite sequences and series, Vectors in Space, Vector-Valued Functions, Multivariable Functions and Partial Derivatives, Multiple Integrals, Integration on vector fields.

EEE 106 Technical Drawing (1-2-0) Local Credits:5 ECTS:5

Terminology of technical drawing, types of technical drawings, drawing tools, standard line types and thicknesses, basic geometric drawings, types of perspective projections, principal views and auxiliary views, dimensioning elements and rules, types of section views (full section, half section, broken-out section, offset section, rotated section and auxiliary sections), freehand sketching techniques, introduction to computer aided design, tecnical drawings of electrical-electronics circuit components and circuits, introduction to drawing of electrical installation projects

EEE 108 Introduction to Electrical Engineering (2-0-0) Local Credits:6 ECTS:6

An orientation course introducing the students to the engineering in general and electrical and electronics engineering in particular with a discussion of the past, present and future of major areas. Course emphasizes the ethical issues in electrical engineering.

EEE 110 Linear Algebra (3-0-0) Local Credits:5 ECTS:5

Matrices, determinants and systems of linear equations. Vector spaces, the Euclidian space, inner product spaces, linear transformations. Eigenvalues, diagonalization.

YDE 102 Foreign Language II (Academic Language Skills) (3-0-0) Local Credits:4 ECTS:4

The aim of this course is to help students produce accurate and intelligble English, become more comfortable listening to rapidly spoken English and to improve pronunciation skills at the segmental and suprasegmental levels.

Third Semester

ATA 101 Principles of Ataturk and Turkish Revolution History I (2-0-0) Local Credits:2 ECTS:2

A definition of Revolution/Renovation. The aim and the importance of the Turkish history of renovation. General state of the Ottoman Empire, the reason for the decline. Efforts to save the Ottoman Empire. The current ideals. The First World War. Societies. Mustafa Kemal in Anatolia and the Congresses. The opening of the Great Turkish National Assembly. Reactions to the National Government. National and International policy. The Mudanya treaty. Lousanne conference.

EEE 201 Differantial Equations (4-0-0) Local Credits:5 ECTS:5

First order equations and various applications. Higher order linear differential equations. Power series solutions: The Laplace transform: solution of initial value problems. Systems of linear differential equations: Introduction Partial Differential Equations.

EEE 203 Numerical Methods (3-0-0) Local Credits:5 ECTS:5

Description of Numerical Methods and application of them particularly in engineering. Error analyses in numerical methods, analitical solutions, numerical methods for the solution of systems (linear and non-linear), approximation methods, interpolation, linear regression, numerical integration.

EEE 205 Circuit Theory I (4-0-0) Local Credits:6 ECTS:6

Basic lumped circuit concepts, Basic properties and analysis methods of resistive circuits, Basic properties of dynamic elements, and basic properties and analysis methods of first order and simple second order dynamic circuits. Lumped circuits: Kirchoff`s laws, basic lumped elements, circuit graphs, circuit equations, linear and nonlinear resistive circuits, first and second order dynamic circuits. Introduction to operational amplifier circuits.

EEE 207 Electrical Circuits Laboratory (0-0-4) Local Credits:5 ECTS:5

Basic circuit components, how to set up simple circuits and take measurements, design and implement a simple circuit in order to solve a given problem. Safety Issues. Voltage, current, resistance and power measuring instruments; signal generators; oscilloscopes. Terminal characteristics of linear and nonlinear resistors, capacitors and inductors. Experiments on resistive operational amplifier, RC RL and RLC circuits, transformers, impedance measurement.

EEE 209 Electrical Engineering Materials (3-0-0) Local Credits:5 ECTS:5

The profession of Engineering involves, apart from many other tasks, a proper utilization of materials of nature. Properties of materials form an important part of design and can be changed to make them suitable to manufacture devices that will perform a specific task. A collection of devices perform functions and make possible applications towards improving the standard of living for the benefit of mankind. Hence, it is the aim of this course to provide knowledge, at an introductory level, mainly about semiconductor materials used in electrical engineering.

SEC 201 ELECTIVE COURSE II (OUT OF AREA)* (2-0-0) Local Credits:2 ECTS:2

Fourth Semester

ATA 102 Principles of Ataturk and Turkish Revolution History II (2-0-0) Local Credits:2 ECTS:2

The declaration of the Republic, The importance of the leader and the staff in the revolution Constitutional solutions to the problems related to the Lausanne Conference, The participation of Turkey in pacts and in international organizations, Reactions to the new governmental structure, Trials in the multi party system, The Home and foreign policy of the Republic of Turkey, Atatürk's foreign policy to inspire confidence in the future of Turkey, Kemalism the Principles of Atatürk.

EEE 202 Circuit Theory II (4-0-0) Local Credits:6 ECTS:6

Analysis methods for dynamic circuits. Sinusoidal steady-state analysis; balanced three phase circuits. Complex frequency domain analysis. Frequency response concepts. Sinusoidal steady-state analysis. Three-phase circuits. Coupled inductors. Frequency response. Linear time-invariant dynamic circuits: state equations, natural frequencies, complex frequency domain analysis. Time-varying and nonlinear circuits.

EEE 204 Semiconductor Devices and Modelling (3-0-0) Local Credits:5 ECTS:5

Basic semiconductor concepts. Physical electronics. Physics of p-n junction diodes, bipolar junction transistors (BJTs)and field-effect transistors. Transistor biasing and small-signal models. Secondary effects in transistors. Dynamic models for diodes and transistors. p-n-p-n switching devices. Modeling concepts for computer-aided design and introduction to circuit analysis with computer software.

EEE 206 Electronic Circuits Laboratory (0-0-4) Local Credits:4 ECTS:4

Basic electronic components, how to set up electronic circuits and take measurements, how to use different computer software for simulation and measurement purposes. Practical usage of basic instruments for measurements and analysis of electronic circuits. Experiments on rectifier diodes, Zener diodes, transistors (BJT and FET) and on circuits composed of these devices: AC and DC analyses, biasing, thermal effects.

EEE 208 Electromagnetic Fields Theory (4-0-0) Local Credits:6 ECTS:6

Review of vector analysis. Electrostatic fields in vacuum and material bodies. Dielectric properties of materials. Electrostatic energy and forces. Steady electric current and conductors. Static magnetic fields in vacuum and in materials. Magnetic energy and forces. Quasistatic fields and electromagnetic induction.

EEE 210 Probability and Statistics (3-0-0) Local Credits:5 ECTS:5

Axiomatic definition of probability spaces. Combinatorial methods. Conditional probability; product spaces. Random variables; distribution and density functions; multivariate distribution; conditional distributions and densities; independent random variables. Functions of random variables; expected value, moments and characteristic functions.

SEC 202 ELECTIVE COURSE III (OUT OF AREA) (2-0-0) Local Credits:2 ECTS:2

Fifth Semester

EEE 300 Summer Practice I (0-0-0) Local Credits:0 ECTS:0

Minimum four weeks (20 working days) of practical work in an organization with a sizable electrical or electronics operation. Special attention should be given to most but not necessarily all of the following subjects: production, operation, maintenance, management and safety. A formal report as described in the Summer Practice Guide is to be submitted.

EEE 301 Signals and Systems I (4-0-0) Local Credits:6 ECTS:6

Signals, Systems, and Signal Processing, Sampling Theorem and Signal Reconstruction, Analog-to-Digital and Digital-to-Analog Conversion, Discrete-Time Signals and Systems, Classification of Signals and Systems, Analysis of Discrete-Time Linear Time-Invariant Systems, Impulse Response and Convolution, Discrete-Time Systems Described by Difference Equations, The Z-Transform and Its Application to The Analysis of LTI Systems, Analysis of Linear Time-Invariant Systems in the z-Domain.

EEE 303 Electromagnetic Waves (4-0-0) Local Credits:6 ECTS:6

Maxwell`s equations in time and frequency domains. Electromagnetic energy and power. Wave equation. Uniform plane electromagnetic waves; reflection and refraction. Introduction to transmission lines, waveguides, antennas and radiation.

EEE 305 Analog Electronics I (4-0-0) Local Credits:5 ECTS:5

By the end of the course the students will be able to analyze and design analog eletronics circuits, mainly amplifier circuits based on BJTs and MOSFETs. Basic single-stage transistor amplifiers and frequency responses. Multi-stage amplifiers. Feedback in amplifiers. Differential pair stages. Current mirrors. Operational amplifiers. Power amplifiers. Power supplies and regulators

EEE 307 Analog Electronics Laboratory (0-0-4) Local Credits:3 ECTS:3

Regulated DC Power Supplies, Multistage Amplifiers. High Frequency Effects. Differential Amplifiers. Feedback Amplifiers. Tuned Circuits. Power Amplifiers. Operational Amplifiers. Optoelectronic Circuits.

EEE 309 Electromechanical Energy Conversion I (4-0-2) Local Credits:6 ECTS:6

Electrical safety. Electromagnetic circuits. Properties of ferromagnetic materials. Single-phase and three phase transformers. Per Unit System. Principles of electromechanical energy conversion: Linear and nonlinear systems; singly and multiply excited translational and rotational systems. DC machines: Theory, generators, motors, speed control.

TDB 101 Turkish Language I (2-0-0) Local Credits:2 ECTS:2

Definition of Language, Language and Thought, Language and Culture, World Languages (In Point of Origin and Structure), The Significance of Turkish Language among World Languages, The Historical Development of Turkish Language, The Structure of Turkish Language, Turkish Phonetics, Todays Turkish Language, The Act of Writing and the Rules of Writing (Orthography), Spelling Rules, The Right Expression of Thought, Scientific Language and Turkish as a Scientific Language, Turkish Poetry and Poetry Language.

SEC 301 ELECTIVE COURSE IV (OUT OF AREA)*

Sixth Semester

EEE 302 Feedback Systems (3-0-0) Local Credits:5 ECTS:5

Mathematical modeling: Transfer functions, state equations, block diagrams. System response; performance specifications. Stability of feedback systems: Routh-Hurwitz criterion, principle of argument, Nyquist stability criterion, gain margin and phase margin. Design of dynamic compensators. Analysis and design techniques using root-locus. State-space techniques: Controllability, observability, pole placement and estimator design. Discrete-time control systems.

EEE 304 Introduction to Logic Design (3-0-0) Local Credits:6 ECTS:6

Binary systems and Boolean algebra. Boolean function simplification. Combinational logic. Sequential synchronous logic. Registers and counters.

EEE 306 Digital Electronics Laboratory (0-0-4) Local Credits:3 ECTS:3

Transistor (BJT) switching circuits. Introduction to logic circuits. TTL an CMOS NAND gates. Paralel adders, subtractors and complementers. Multiplexers, code converters. Comparators with hysteresis. Multivibrator circuits using CMOS gates. Op-amps and 555 timers. Flip flops and counters. Introduction to hardware description language (verilog-HDL)

TDB 102 Turkish Language II (2-0-0) Local Credits:2 ECTS:2

Written Expression, Method and Planning of Written Expression, Writing Exercise, Scientific Texts (Article-Report-Critic), Official Texts (Petition-Resume), Genres of Literature, Essay, Column, Travel Writing, Biography, Story, Novel, Verbal Literature, Verbal Expression and Communication.

SEC 302 TECHNİCAL ELECTİVE COURSE I (3-0-0) LOCAL CREDİTS:6 ECTS:6

SEC 302.1 Signals and Systems II (3-0-0) Local Credits:6 ECTS:6

The Concept of Frequency in Continuous-time and Discrete-time Signals, Complex Exponential Signals and Harmonically Related Complex Exponentials, Frequency Analysis of Continuous-Time and Discrete-Time Signals, Fourier Series, Fourier Transform, Discrete-Time Fourier Transform and Discrete Fourier Series, Analysis and Synthesis Equations, Power and Energy Spectrum Density, Fourier Transform Theorems and Properties, Frequency-Domain Characteristics of Linear Time-Invariant Systems, The Discrete Fourier Transform (DFT).

SEC 302.2 Digital Electronics (3-0-0) Local Credits:6 ECTS:6

Large signal transistor models. TTL, MOS and CMOS logic gates: Inverters, input and output circuits, NAND and NOR gates; static and dynamic analyses. Regenerative circuits: Astable, monostable, bistable multivibrators and Schmitt triggers. Introduction to VLSI. Static and dynamic memories: RAM, ROM, EPROM, 5670PROM, etc. A/D and D/A converters.

SEC 304 TECHNİCAL ELECTİVE COURCE II (3-0-0) LOCAL CREDİTS:6 ECTS:6

SEC 304.1 Electromechanical Energy Conversion II (3-0-0) Local Credits:6 ECTS:6

Electromagnetic fields created by AC electric machine windings: pulsating and rotating magnetic fields, emf induced in a winding. Induction machines: equivalent circuit, steady-state analysis, speed control. Synchronous machines: equivalent circuit, steady-state analysis, stability. Single-phase induction machines. Special electrical machines.

SEC 304.2 Electrical Equipment and Applications (2-0-0) (3-0-0) Local Credits:6 ECTS:6

Introduction to power systems. Real and reactive power concepts. Reactive power compensation. Three-phase system analysis. Modeling of acrial lines and cables. Modeling of transformers, generators and loads. Per-unit system. Three-phase fault phenomena and analysis. Protective devices. Electrical grounding and safety.

SEC 304.3 Analog Electronics II (2-0-0) Local Credits:2 ECTS:2

To provide a working knowledge of operational amplifiers and their applications, their frequency response and achieve competency in the use of computer aided design tools for op-amp circuitry modeling, analysis, and design.

SEC 306 ELECTIVE COURSE V (OUT OF AREA)* (2-0-0) Local Credits:2 ECTS:2

ELECTIVE COURSES (SEC 101,SEC 201,SEC 202,SEC 301,SEC 306)

KRP 101 Carrier Planning (2-0-0) Local Credits:2 ECTS:2

Career concept Career planning Relationship between career planning and vocational counseling Individual career development CV preparation and CV types Job interview Career planning process Evaluation of the Turkish education system in line with career planning Applicability of career counseling in schools Lifelong career planning Career planning in retirement

SEC 101.1 History of Art (2-0-0) Local Credits:2 ECTS:2

Basic concepts used in the field of Art History, Central Asian Turkish Art, the birth and development of Turkish Islamic Art will be given

SEC 101.2 History and Philosophy of Science (2-0-0) Local Credits:2 ECTS:2

Historical development of science, approaches to science philosophy.

SEC 101.3 Disaster Awareness (2-0-0) Local Credits:2 ECTS:2

General information about disaster awareness, earthquake, flood, drought, landslide hazard and risk management.

SEC 101.4 Eloquent Speech (2-0-0) Local Credits:2 ECTS:2

Basic concepts and terms related to speech, elements that make speech effective and beautiful, the fundamentals of speech, the types of speech, the issues to be considered for speaking correctly, beautifully and effectively, expression and language mistakes, speech disorders, effective speech techniques.

SEC 101.5 Basic First Aid and EMAKErgency (2-0-0) Local Credits:2 ECTS:2

General first aid information, Patien-wounded and crime scene evidence and symptoms used in evaluating teaching, Basic life support, Bleeding first aid, Burns, freezing and heat prostration in the first aid,Consciousness disorders aid,Injuries first aid,In an animal bite first aid. Ear and nose foreign bodies in many first aid, Drowning first aid, Fracture, dislocation and sprain first aid, Poisonings, Patient/injured carrying techniques, Organization of emergency care services.

SEC 101.6 Archery (2-0-0) Local Credits:2 ECTS:2

Collaborative teaching and teamwork practices. Creative games and applications in sports. Learning Archery Basic Skills through interdisciplinary teaching and cooperation. Archery Basic Skills teaching and practice.

SEC 101.7 Boxing, Karate and Taekwondo (2-0-0) Local Credits:2 ECTS:2

Collaborative teaching teamwork practices - Creative games and applications in sports - Learning Boxing, Karate and Taekwondo Basic Skills with interdisciplinary teaching and collaboration - Teaching and applications of Basic Boxing, Karate and Taekwondo

SEC 101.8 Football (2-0-0) Local Credits:2 ECTS:2

Collaborative teaching teamwork practices - Creative games and applications in sports - Learning Football Basic Skills with interdisciplinary teaching and collaboration - Teaching and applications of Basic Football Skills - "Creative Games" and Teamwork applications in Football

SEC 101.9 Volleyball (2-0-0) Local Credits:2 ECTS:2

Characteristic features of volleyball, history and rules of the game, warm-up and exercise, ball, pass, cuff, service, dunk, block, defense techniques, game and game preparation work: 1. Simple movements to make constant, 2. To make the same movements, 3. Making individual techniques in team play form, 4. Repeating movements in difficult and different environments, 5. What is skill 6. How to gain skill

SEC 101.10 Basketball (2-0-0) Local Credits:2 ECTS:2

History of basketball, game rules, knowledge and skills about basic techniques and tactics.

SEC 101.11 Tennis (2-0-0) Local Credits:2 ECTS:2

It covers the theoretical education and applications of general theoretical knowledge, basic technical and tactical exercises.

SEC 101.12 Table Tennis (2-0-0) Local Credits:2 ECTS:2

History of table tennis, game rules, knowledge and skills about basic techniques and tactics.

SEC 101.13 Folk Dances (2-0-0) Local Credits:2 ECTS:2

Local, national and international folk dance cultures and their basic dance steps are handled.

SEC 101.14 Music Culture (2-0-0) Local Credits:2 ECTS:2

Examination of the music cultures in the world on the basis of regions, countries and cultures.

SEC 101.15 Arts&Painting (2-0-0) Local Credits:2 ECTS:2

The aim of this course is to familiarize students with the basic concepts of art and aesthetics and to gain a perspective on the social history of art.

SEC 101.16 Theatre and Cinema (2-0-0) Local Credits:2 ECTS:2

Practical exercises that encourage and develop collaborative work on stage. Discussions over these workshops and plays watched during the week. Short design tasks and working on these pieces.

SEC 101.17 Healthy Living (2-0-0) Local Credits:2 ECTS:2

Students who successfully complete this course; Knows the dynamics necessary for a healthy life, Adopts the concept that a healthy life is one of the fundamental rights and freedoms of every citizen, Knows what are the duties of individuals and society to create and protect healthy life.

SEC 101.18 Nutrition (2-0-0) Local Credits:2 ECTS:2

General principles of human nutrition, Food chemistry; Nutritional value of foods; Balanced diet; Possible alternative solutions to nutritional problems, Food technologies, Cooking technologies, Nutrients in collective nutrition organizations, Hygiene and environmental health, Dry nutrition health. Types of nutrients which are essential in nutrition; Physical and chemical properties of nutrients; Common feeding problems and solutions; Nutrition in diseases. Distinction of food according to nutritional value.

SEC 101.19 Media Literacy (2-0-0) Local Credits:2 ECTS:2

Media Literacy course in Turkey has entered into all over the world as well as elective courses in the curriculum. In this context, the importance of this course to the students of our university, to explain the method, methodology, and to provide information about Media Writing constitutes the content of the course.

SEC 101.20 Mathematical Esthetics (2-0-0) Local Credits:2 ECTS:2

This course will begin to learn how to design aesthetic mathematical experiences

SEC 101.21 Industrial Design (2-0-0) Local Credits:2 ECTS:2

The students who succeeded in this course; Student will be able to apply basic design methods and creativity techniques to given design problems. Student will be able to identify, find and interpret information that is relevant to the given design problems. Student will be able to develop skills in physical model making and CAD modelling and manual rendering techniques in the resolution of design problems. Student will be able to experience design problems introducing to problems of the context of a product, and its utility, usability, visual appearance, and manufacturability. Student will be able to use techniques and gain experience in sharing ideas and working in groups.

SEC 101.22 Basic Photography (2-0-0) Local Credits:2 ECTS:2

Basic photography knowledge. The importance of photography in graphic design. Composition in photography. Machine use. Photography information in outdoor, indoor and studio.

SEC 101.23 Surfing (2-0-0) Local Credits:2 ECTS:2

1. Basic Concepts Water Sports a. Definition b. Philosophy c. Types 2. Types of Water Sports a. Wind and wave surfing b. Catamaran c. Yachting-Sailing d. Canoe e. Swimming f. Free Diving g. Water Polo h. Underwater Hockey i. Jumping Tower j. Underwater Rugby k. Monopalet l. Kite 3. Windsurfing Equipment (Board, sail, clothes, etc.) 4. Basic technique and teaching of windsurfing 5. Safety precautions in windsurfing 5. Basic education and training in the Practice Camp.

SEC 101.24 Japanese I (2-0-0) Local Credits:2 ECTS:2

Reading and writing of the textbooks which include the structures and expressions that have to be learned at the lower intermediate level, and meaning of Kanji characters.

SEC 101.25 Japanese II (2-0-0) Local Credits:2 ECTS:2

Japanese history, culture and civilization.

SEC 101.26 Mythology (2-0-0) Local Credits:2 ECTS:2

Introduction to sociological thinking; the foundations of society; social divisions and inequalities; social structures, social practices and social institutions; social change

SEC 101.27 Ancient City (2-0-0) Local Credits:2 ECTS:2

With the settled life of humanity, civilizations and cities established by civilizations began to take shape in line with the availability of geographical locations. Cities have been developed with various business areas such as agriculture and trade. Cities, which reflect the characteristic identities of civilizations and which are the physical equivalent of living cultures, have reached our age for thousands of years. As a result of archaeological research and studies carried out in ancient cities, comprehensive information is obtained about the civilizations they founded. In the light of this information, major civilizations and ancient cities are examined within the scope of the course, and thus the connections between the past and our times are explained with both life styles and urban architecture and artistic features.

SEC 101.28 Sociology (2-0-0) Local Credits:2 ECTS:2

Introduction to sociological thinking; the foundations of society; social divisions and inequalities; social structures, social practices and social institutions; social change

SEC 101.29 Philosophy (2-0-0) Local Credits:2 ECTS:2

Program helps students develop critical thinking skills, linguistic ability and the ability to defend a reasoned point of view. Also students learn to critique world-views and come to their own ideas on what is true and how to live.

SEC 101.30 Ancient DNA: History of the Past (2-0-0) Local Credits:2 ECTS:2

"Ancient DNA studies" are generally defined as an area that includes DNA harvesting and analysis studies from highly biological samples that have been severely damaged and have no protection. DNAs derived from materials found in archaeological excavations shed light on the past. Research on ancient DNA (aDNA) obtained from archaeological and paleontological remains allows direct access to genetic information in the past. In this context, ancient DNA (aDNA) studies have an interdisciplinary character. This course covers the researches on ancient DNA and how to make DNA isolation from fossils extracted from archaeological excavations (human, animal, plant, etc.), and later on how gender determination and bioinformatics-based polymorphism studies are conducted.

SEC 101.31 Genetic Heritage (2-0-0) Local Credits:2 ECTS:2

Mitosis and Meiosis, Mendelian Genetics, Extensions of Mendelian Genetics, Linkage, Crossing over and Mapping in Eukaryotes, Sex Chromosomes, Chromosome Mutations, DNA Structure and Analysis, DNA Replication and Recombination, Chromosome Structure and DNA Sequence Organization, Transcription, Translation and Proteins, Gene Mutation, DNA Repair and Transposable Elements, Genetics of Bacteria, Regulation of Gene Expression in Prokaryotes, Regulation of Gene Expression in Eukaryotes, Recombinant DNA Technology

SEC 101.32 Modern Genetic Applications: Gene Cloning (2-0-0) Local Credits:2 ECTS:2

History of gene cloning, cloning applications, ethics in cloning

SEC 101.33 Food and Food Culture (2-0-0) Local Credits:2 ECTS:2

Through this course, you will explore a variety of culture specific foods and preparation techniques.

SEC 101.34 Diet and Health (2-0-0) Local Credits:2 ECTS:2

General principles of human nutrition, Food chemistry; Nutritional value of foods; Balanced diet; Possible alternative solutions to nutritional problems, Food technologies, Cooking technologies, Food in collective nutrition establishments, Hygiene and environmental health, Dry nutrition health. Types, quantity, properties and functions of nutrients essential in nutrition; Composition of foods, Physical and chemical properties; Common nutritional problems and solutions; Nutrition in diseases. Separation of foodstuffs according to their nutritional value.

SEC 101.35 Traditional Foods (2-0-0) Local Credits:2 ECTS:2

Our foods in Turkish nutritional culture and their detailed content

SEC 101.36 Organic Agriculte (2-0-0) Local Credits:2 ECTS:2

It contains information about the principles, objectives and rules of organic agriculture, processes of organic agriculture, control, certification and legal regulations, processing of organic foods and additives used.

Seventh Semester

EEE 400 Summer Practice II (0-0-0) Local Credits:0 ECTS:0

Minimum four weeks (20 working days) of practical work in an organization with a sizable electrical or electronics operation. Special attention should be given to most but not necessarily all of the following subjects: maintenance, production planning, management, quality control and design. A formal report as described in the Summer Practice Guide is to be submitted.

ISG 401 Occupational Health and Safety I (2-0-0) Local Credits:2 ECTS:2

The course is designed to assist the student with the implementation of safe and healthy practices at laboratories and university campus. This course enables students to learn safe work practices as well as how to identify and prevent or correct problems associated with safety and health in these locations.

EEE 401 Electrical Engineering Design (0-3-0) Local Credits:6 ECTS:6

Fundamentals of design, project management, design tools, simulation standards and safety, quality concepts, ethics, design experience through a team project.

EEE 403 Renewable Energy Sources (2-0-0) Local Credits:4 ECTS:4

Renewable energy sources, importance of energy sources, energy sources for electricity, hydroelectricity, biomass energy, solar energy, geothermal energy, wind power, nuclear energy, hydrogen energy, tidal power, wave power

SEC 401 TECHNİCAL ELECTİVE COURSE III* (3-0-0) LOCAL CREDİTS:6 ECTS:6

Eighth Semester

EEE 402 Graduation Thesis (0-2-0) Local Credits:8 ECTS:8

Conduct research, communicate the procedures for and results of the research, critically analyze the literature, present a detailed methodology and accurate results, verify knowledge claims and sources meticulously, link the topic of the thesis with the broader field.

ISG 402 Occupational Health and Safety II (1-0-0) Local Credits:1 ECTS:1

OHS management system, industrial hygiene, risk management, root-cause analysis of accidents, cost of accidents, occupational diseases and work-related diseases, case studie

EEE 404 Principles of Economics (2-0-0) Local Credits:3 ECTS:3

A non-departmental course designed for students outside the Faculty of Economic and Administrative Sciences. The nature of economics. A general view of price system. Markets and pricing. The determination and the control of national income. Fiscal policy. Money, banking and monetary policy. International trade and finance. Economic growth and development.

SEC 402 ELECTİVE COURSE IV (TECHNİCAL COURSE)* (3-0-0) LOCAL CREDİTS:6 ECTS:6

Seventh and Eighth Semester Elective Courses

SEC 401.1 Introduction to Medical Imaging (3-0-0) Local Credits:6 ECTS:6

Fundamentals of X-ray, generation and detection of X-rays, X-ray diagnostic methods, X-ray image characteristics, biological effects of ionizing radiation. Fundamentals of acoustic propagation, generation and detection of ultrasound, ultrasonic diagnostic methods, biological effects of ultrasound. Fundamentals of radionuclide imaging, generation and detection of nuclear emission, radionuclide imaging methods, radiation dosimetry and biological effects. Fundamentals of magnetic resonance imaging, generation and detection of NMR signal, imaging methods, biological effects of magnetic fields.

SEC 401.2 Biomedical Signals, Instrumentation and Measurement (3-0-0) Local Credits:6 ECTS:6

Fundamentals of biomedical signals, measurement and instrumentation; biomedical transducers; membrane biophysics, electrophysiology of excitable cells, membrane models; theory of bioelectrical signals, electrocardiography (ECG), electroencephalography (EEG), electromyography (EMG); biopotential electrodes; biopotential amplifiers and instrumentation techniques, electrical and patient safety; examples of monitoring, therapeutic and prosthetic devices.

SEC 401.3 Digital Signal Processing (3-0-0) Local Credits:6 ECTS:6

Statistics, Mean and Standard Deviation signals, Noise and Signal-to-Noise Ratio (SNR), Histogram of Signals, Biomedical Signal Processing, Analog Filter Design Revisited, Digital Filters and Filter Design Techniques, IIR Filters, FIR Filters, Fast Fourier Transform (FFT), Applications of Digital Signal Processing

SEC 401.4 Communications I (3-0-0) Local Credits:6 ECTS:6

Amplitude modulation (AM) and other linear carrier wave(CW) modulation techniques. Frequency/phase modulation (FM/PM).Superheterodyne receivers and applications. Noise in CW modulated systems. Sampling and quantization, Pulse Code Modulation(PCM). Geometric representation in signal space. Antipodal and orthogonal signaling schemes. Basic types of baseband and passband binary digital modulation.

SEC 401.5 Communications II (3-0-0) Local Credits:6 ECTS:6

M-ary digital modulation. Spectrum of digital modulation schemes. Transmission in band-limited channels. Synchronization. Wireless channel models. Multi-carrier modulation .Multi-antenna communication .Introduction to information theory.Introduction to coding theory.

SEC 401.6 Integrated Communication Systems (3-0-0) Local Credits:6 ECTS:6

This course is concerned with analog integrated circuits for communications with an emphasis on integrated RF circuits. Both theory and circuit design are covered. The course begins with a brief introduction of modern communication systems (both wireless and wireline). It is followed with a review of MOS and bipolar transistor basics. Amplifier circuits are reviewed. A detailed discussion on noise, noise contributors of circuit elements, as well as the analysis of noise in a circuit will be one of the core subjects. Linearity and a general treatment of distortion is presented, and circuit examples are given. Oscillators, and PLLs will be introduced. The course will finalize with a discussion on Mixers, Image Reject Mixers, and Modulators

SEC 401.7 Data Structures (3-0-0) Local Credits:6 ECTS:6

Arrays, stacks, queues, linked lists, trees, hash tables, graphs: Algorithms and efficiency of access. Searching and sorting algorithms.

SEC 401.8 Computer Architecture I (3-0-0) Local Credits:6 ECTS:6

Asynchronous logic system. Algorithmic state machines. CPU organization. Construction of arithmetic logic unit. Process control architectures. Instruction modalities. Microprogramming. Bit slicing.

SEC 401.9 Computer Architecture II (3-0-0) Local Credits:6 ECTS:6

Arithmetic processor design, arithmetic algorithms. Memory organization, parallel processing, multiprocessors systems. Peripheral organization. I/O processing. I/O controllers.

SEC 401.10 Introduction to Microprocessors (3-0-0) Local Credits:6 ECTS:6

Microprocessor architecture; a particular microprocessor software (to be selected). I/O interfacing. Interrupt processed I/O. Direct memory access. Microprocessor based communications.

SEC 401.11 Programming Languages (3-0-0) Local Credits:6 ECTS:6

Evolution of programming languages. Overview of language translation, virtual machines, and run-time environments. Names, bindings and scopes. Values, expressions and types. Type compatibility and type checking. Storage, variables, and commands. Procedural abstraction. Generic units. Overview of functional programming paradigm. Overview of object-oriented programming paradigm: encapsulation, classes and objects, inheritance, polymorphism, dynamic binding.

SEC 401.12 Introdcution to Embedded Systems Design (3-0-0) Local Credits:6 ECTS:6

Review of core and edge network architectures.Introduction to in-vehicle and industrial communication networks.Quality of Service and real-time operation concepts.Basic router architectures.Fabric scheduling.Quality of Service schedulers.Packet processing and lookup.Switch fabric architectures.IPv6 and Next Generation Networks.In-vehicle networking system requirements and architectures.CAN Bus,LIN.Byteflight,FlexRay.Scheduling for CAN Bus and FlexRay.Industrial Communication Networks.Real time Ethernet.

SEC 401.13 Fundamentals of Machine Learning (3-0-0) Local Credits:6 ECTS:6

Probability, graphs, Bayesian networks, Markov networks, temporal models, state observation models, Gaussian networks, exact inference, map inference and approximate inference (sampling) in these models, probability distributions, graph parameter learning with complete and incomplete data, graph structure learning by complete and incomplete data.

SEC 401.14 Microprocessor Interfacing Systems (3-0-0) Local Credits:6 ECTS:6

Microprocessor architecture; a particular microprocessor software (to be selected). I/O interfacing. Interrupt processed I/O. Direct memory access. Microprocessor based communications.

SEC 401.15 Computer Networks (3-0-0) Local Credits:6 ECTS:6

The layered architecture, Local Area Networks, data link protocols, error correction with FEC and ARQ, routing, flow control, transport protocols, application layer protocols, recent subjects in networking.

SEC 401.16 Database Programming for Internet Applications (3-0-0) Local Credits:6 ECTS:6

Relational model of data. Relational algebra. SQL. Query optimization. Entity-Relationship data model. Normalization, physical database design. Concurrency control in DBMSs. Crash recovery. Client-server architectures. Introductions to object databases, distributed databases, web data management.

SEC 401.17 Introduction to Internet of Things (3-0-0) Local Credits:6 ECTS:6

The class will introduce the enabling technologies, protocols, software architectures and applications for the development of the emerging Internet of Things (IoT) paradigm. The class will provide a exhaustive illustration of the enabling components of IoT systems. These will include wireless communications among end-devices and towards infrastructures, data processing, languages for the development of applications and prototypes

SEC 401.18 Discrete Time Systems (3-0-0) Local Credits:6 ECTS:6

Importance and advantages of discrete time system models in control. Time domain analysis of discrete-time systems. Sampled data systems. Stability; translation of analog design. State space design methods: observer theory, introduction to optimal design methods. Quantization effects.

SEC 401.19 Laboratory of Feedback Control Systems (3-0-0) Local Credits:6 ECTS:6

Digital control of linear and nonlinear electromechanical systems; components of a digital control system; simulation models; Proportional-Derivative (PD) position control; lead-compensator speed control; pole-placement based state-space control of nonlinear cart-pendulum system; Optimal Linear Quadratic Regulator (LQR) based state-space control of flexible-joint and inverted pendulum systems; sampling rate selection and discrete-time controller design; more advanced advanced electromechanical control examples.

SEC 401.20 Process Control (3-0-0) Local Credits:6 ECTS:6

Control of industrial processes: Mathematical modeling of fundamental distributed parameter processes. Lumped parameter approximation. Disturbance filtering characteristics of control loops. Proportional, integral, derivative, on-off, floating modes of controls, feedforward and cascade types of loops. Minimization of integral square error. Characteristics of flow, pressure and level control loops and final control elements. Fundamentals of control of basic processes such as heat exchange, distillation, combustion, drying. Organization of direct digital control loops.

SEC 401.21 Introduction to VLSI Design (3-0-0) Local Credits:6 ECTS:6

Design techniques for rapid implementations of very large-scale integrated (VLSI) circuits, Metal-Oxide-Semiconductor (MOS) technology and logic. Structured design. Design rules, layout procedures. Design aids: layout, design rule checking, logic, and circuit simulation. Timing. Testability. Projects to design and lay out circuits.

SEC 401.22 Introdcution to Analog Integrated Circuits (3-0-0) Local Credits:6 ECTS:6

Analysis and design of bipolar junction transistor (BJT) and metal oxide semiconductor field-effect transistor (MOSFET): multi- stage amplifiers. Analog integrated circuit (IC) building blocks/sub-circuits. Biasing circuits. Differential pairs. Complementary Metal Oxide Semiconductor (CMOS) operational amplifier topologies. Stability analysis and pole-zero cancellation in operational amplifiers. Differential and regenerative comparators.

SEC 401.23 Solid State Devices (3-0-0) Local Credits:6 ECTS:6

Introduction to quantum theory of solids, semiconductor fundamentals and carrier transport, p-n and metal-semiconductor junctions, bipolar junction transistors (BJTs) and metal oxide semiconductor field-effect transistors (MOSFETs): principles, modeling and advanced issues, heterojunctions and advanced electron devices, optical properties of semiconductors, optical devices: photodetectors, solar cells, light emitting diodes and lasers.

SEC 401.24 Computer-Aided Design and Analysis of Electronic Circuits (3-0-0) Local Credits:6 ECTS:6

Small and large signal HF amplifier design. HF oscillators. Noise considerations in RF amplifiers. RF amplifiers. Microstrip and stripline techniques. Transistor and amplifier measurement techniques. Computer aided design of amplifiers.

SEC 401.25 Programmable Logic Controllers (3-0-0) Local Credits:6 ECTS:6

Programmable logic controllers (PLC) forming hardware structures, Discrete inputs / outputs, PLC scanning, PLC programming languages, Ladder diagram language, basic PLC functions, Logic operations, Comparison and conversion operations, Counters, Timers, Interrupt and subroutine operations, Arithmetic operations, Scroll and rotation operations, Table operations, Application examples.

SEC 401.26 Optics and Photonics Systems (3-0-0) Local Credits:6 ECTS:6

Introduction to geometric optics; ray theory and electromagnetic wave theory of optical propagation in fibers. Optical fibers and their transmission characteristics. Cables, connectors and couplers. Introduction to optical sources and detectors. Principles of optical communication systems, performance analysis and design.

SEC 401.27 Antennas and Propagation (3-0-0) Local Credits:6 ECTS:6

Antenna parameters. Linear antennas. Influence of earth on antenna radiation pattern and impedance. Radiation from slot and aperture antennas. Antenna arrays and the general array formula. Baluns. Receiving antenna theory. Elements of groundwave, tropospheric and ionospheric propagation.

SEC 401.28 Microwaves I (3-0-0) Local Credits:6 ECTS:6

TEM mode transmission lines. Field and distributed circuit analysis. Frequency and time domain analysis. Waveguiding structures. Rectangular and circular waveguides. Impedance transformations and matching techniques. Scattering matrix of microwave junctions.

SEC 401.29 Microwaves II (3-0-0) Local Credits:6 ECTS:6

Passive reciprocal and nonreciprocal devices. Electromagnetic resonators. Periodic structures and microwave filters. Microstripline structures and coupled lines. Solid state microwave devices.

SEC 401.30 Real-time Applications of Digital Signal Processing (3-0-0) Local Credits:6 ECTS:6

Introduction to real-time processing hardware and software, Signal types, Fast Fourier Transform, Correlation, Detection of signals in noise, Decimation, Interpolation, Filtering, Phase locked loop, System identification and adaptive filtering, Least Mean Square algorithm, Optimum filtering, Finite-impulse response Wiener filter, Two-dimensional signals, Transforms, and Filtering.

SEC 401.31 Special Topics: Vector Space Methods in Signal Processing (3-0-0) Local Credits:6 ECTS:6

Vector-space concepts in relation to signals and systems; signal subspaces; signal representation in different bases; norms and inner products; systems as operators; projectors; linear algebraic and statistical approaches to solving linear equations; least-squares problems; linear minimum mean square error estimation; solving large-dimensional linear equation systems; applications in signal processing including filter design, approximation, interpolation, data compression, signal estimation and inverse problems.

SEC 401.32 Power System Analysis I (3-0-0) Local Credits:6 ECTS:6

Basic structure of electrical power systems. Electrical characteristics of transmission lines, transformers and generators. Representation of power systems. Per Unit System. Symmetrical three-phase faults. Symmetrical components. Unsymmetrical faults.

SEC 401.33 Power System Analysis II (3-0-0) Local Credits:6 ECTS:6

Matrix analysis of power systems networks and methods of solution. Load flow and short circuit analysis. Economic operation of power systems. Transient stability analysis.

SEC 401.34 Distribution Systems (3-0-0) Local Credits:6 ECTS:6

Basic considerations. Load characteristics and forecasting methods. Distribution substations. Subtransmission, primary and secondary distribution. Choice of voltage levels. Operational characteristics of cables, aerial lines and transformers. System voltage regulation. Power factor correction. Fusegear, switchgear, current and voltage transformers. Overcurrent and thermal protection. Earthing methods. Economics of distribution systems.

SEC 401.35 High Voltage Techniques (3-0-0) Local Credits:6 ECTS:6

Field analysis: experimental and numerical (finite difference, finite element and charge simulation) methods and applications. Electrical breakdown in gases: ionization processes. Townsend s breakdown criterion, Paschens Law, bread-down in electronegative gases, time lags. Streamer-Kanal mechanism, breakdown in non-uniform field and corona. Electrical break-down of liquids: breakdown mechanism of pure and commercial liquids. Electrical breakdown of solids: Intrinsic, electromechanical, thermal and erosion mechanism. Insulating materials: dielectric gases; insulating oils and solid dielectrics.

SEC 401.36 Utilization of Electrical Energy (3-0-0) Local Credits:6 ECTS:6

Basic operating characteristics and classification of electrical drives. Solid state DC motor control. Solid state AC motor control. Dynamic behavior of electrical machines. Electric braking. Starting of electrical machines. Intermittent loads. Drive applications. Modern methods of reactive power compensation. Electrical energy saving.

SEC 401.37 Static Power Conversion I (3-0-0) Local Credits:6 ECTS:6

Power switches and their characteristics. Power converter definitions, classification. VTA method. Midpoint and bridge rectifiers: non-ideal commutation, harmonics, input power factor, utility-factor, winding utilization and unbalances in rectifier transformers. Applications.

SEC 401.38 Static Power Conversion II (3-0-0) Local Credits:6 ECTS:6

Introduction to forced commutated circuits, analysis, classification of techniques. Centretap inverter. Voltage-fed inverters; waveshaping; PWM, stepped and square-waveforms, voltage regulation, harmonics. Current-fed inverters; analysis, effect of SCR turn-off time on voltage waveform, overlap. DC-DC switching converters; time-ratio control, effect of loading, parameter optimization. Device failure mechanisms. Thermal considerations, maximum ratings, protection of switching elements. Series and parallel operation of switching elements.

SEC 401.39 Power Electronics I (3-0-0) Local Credits:6 ECTS:6

Teaching solid-state devices Understanding of AC-DC converter circuits operation Calculating of DC output voltage of rectifier Controlling of DC output voltage of rectifier Understanding operation of AC-AC converter Calculating of AC-AC converter output voltage Controlling of output voltage of AC-AC converter Designing the single phase rectifier and AC-AC converter Designing three-phase AC-AC and

AC-DC converter Teaching the general structure of DC-DC choppers Teaching the general structure of DC-AC converter.

SEC 401.40 Power Electronics II (3-0-0) Local Credits:6 ECTS:6

Introduction and a short review on converters. Zero-voltage and/or zero-current switchings. Load resonant converters. Resonant switch converters. Switching DC power supplies Control of switch-mode DC power supplies. Power conditioners and uninterruptible power supplies. Introduction to direct and alternative current motor drives. Direct current motor drives. DC servo drives. Induction motor drives. Synchronous motor drives. Power electronic industrial applications. Special topics in industrial applications.

SEC 401.41 Introduction to Hybrid and Electric Vehicles (3-0-0) Local Credits:6 ECTS:6

Vehicle fundamentals and longitudinal dynamics. Electrified vehicle topologies and drive system components. Rail traction. Electric machines in traction applications. Permanent magnet synchronous machine drives. ınduction motor machine drives. Synchronous and switched reluctance machine drives. Design of electric machines for traction applications. Drive system simulations.