UNIVERSITY OF KYRENIA

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

Course Catalogue

CONTENTS

This course catalogue is developed to give information about the electrical and electronic engineering programme in Faculty of Engineering, University of Kyrenia.

The catalogue includes key information about the duration of the programme, mode of study, course description, credit and grading system etc. of the programme.

We hope you can find the necessary information to your questions about the Department of Electrical and Electronic Engineering and the course programme.

Sincerely

Assoc.Prof. Dr. Akbar Abbasi
Program Coordinator

Electrical and Electronic Engineering (EE) Programme

1. General Information about the Department of Electrical and Electronic Engineering

Electrical engineering is a profession that uses science, technology, and problem-solving skills to design, construct, and maintain products, services, and information systems. Degree program offered by the faculty aims to train students in this field and prepare them for a career in electrical engineering related jobs.

Our program has been designed to give students both a theoretical and a practical understanding of the fundamental issues related to electronics and circuitry and their use in everyday life. Program is well structured and has been designed with the aim of providing an excellent foundation in many areas.

Graduates can virtually find jobs in all electrical and electronic related areas. Some popular areas are: telecommunications industry, power generation industry, defense industry, and electronics industry.

Vision of the programme

To meet the challenges of new technological advances and to provide update knowledge in the state of the art technology, re-orientation and up graduation of the curriculum to the level of industry relevant learning and training and thus to be a premier technical department that strives continuously for excellence in education and research.

Mission of the programme

a. To provide knowledge based technology and Service to meet the needs of society globally.

b. To help in building national capabilities for excellent energy management and to explore non-conventional energy sources.

c. To create research oriented culture and to provide competent consultancy.

d. To create and sustain environment of learning in which students acquire knowledge and learn to apply it professionally with due consideration of ethical and economical issues.

e. To be accountable through self-evaluation and continuous improvement.

The medium of instruction is English.

Official length of programme: 4 years (excluding one year of English preparatory), 2 semesters per year, 14 weeks per semester.

Mode of study: full time

Profile of the Programme and Method of Education

Lectures by (teaching staff) instructor, class discussion, and individual projects are implemented as the method of education. The curriculum is planned with a multidisciplinary approach in mind. Detailed information on the curriculum is given extensively in Appendix The bachelor's degree offerscourses in the following areas of specialization: electric power systems, telecommunications,and control systems. In addition, it aims to teach and develop the leadership skills of students so that they can take managerial positions and be leaders in their future careers.

Qualification Awarded

Bachelor of Science (B.Sc.)

Level of Qualification

Qualifications Framework- European Higher Education Area (QF-EHEA): 1

2. Access requirement(s)

High School Diploma. Admission of Turkish nationals is by Placement through anation-wide Student Selection Examination (ÖSS) administered by Assessment, Selection and Placement Centre (ÖSYM). Admissions of Turkish Cypriotsis based on the University of Kyrenia Entrance and Placement exam. Admission of international students is based on their high school credentials. Proof of English Language proficiency is also required.

3. Qualification Requirements

150 (University of Kyrenia Credit is contact hour based) credits, which is total 240 ECTS credits must be completed after being successful in the courses to become a graduate of the Electrical and Electronic Engineering department.

ECTS is a credit system designed to make it easier for students to move between different countries. Since they are based on the learning achievements and workload of a course, a student can transfer their ECTS credits from one university to another so they are added up to contribute to an individual's degree programme or training. ECTS helps to make learning more student-centred. It is a central tool in the Bologna Process, which aims to make national systems more compatible.

ECTS also helps with the planning, delivery and evaluation of study programmes, and makes them more transparent

Arrangements for transfer from another Electrical and Electronic Engineering Department

A student wishing a transfer from another university: the student must prove her/his English Proficiency if s/he wishes to attend the English Section. At the time of from the Turkish university entrance examination the candidate's entrance score must not be less than the lowest score for admission to the University of Kyrenia, Electrical and Electronic Engineering department. The transcript and course content of the applicant is examined by the department and the student is then accepted to the appropiate year of the programme.

4. Examination Regulations, Assessment and Grading

The examinations are a way of finding out whether the module objectives have been accomplished. Every module in the degree programme has an examination. The type of examination to be held is laid down in each module description.

At the commencement of the teaching term, students are informed as to examination requirements. All the examinations are done during the examination week. The lectures are cancelled during the examination week. Every effort is made to ensure that no more than one examination is taken by a student on the same day.

The assessment procedures, marking criteria, and examination regulations are available for the students to examine if they wish so. The regulations cover the student absences due to illness, financial, or other reasons.

Written examinations are done for each module except the graduation projects. There are some modules that make oral examinations which are indicated in Project/Presentation/ Report activities of the module.

There are two written examinations for each module: mid-term examination, and final examination. The mid-term examinations are done around 6 weeks after the start of a new semester. The final examinations are done at the end of each semester. The examination dates are published in the university calendar at the beginning of each semester.

Students are allowed only to take one make-up exam. The date and time of the make-up exams are announced by the department.

Students who fail in exam are allowed to get re-sit exam at the end of any semester.

The graduation projects are completed in 2 semesters. Students are assigned supervisors for the duration of their graduation projects. Students can carry out their graduation project externally in the industry after approving their topic and supervisor by the department. Graduation project assessment consists of the preparation of a bound report by the student, and also an oral presentation to jury members. The jury members are selected from the departmental staff according to the topic of the presentation and there must be at least 2 members at the jury. Students are expected to prepare slides and present their projects orally. The presentation time is 10-15 minutes for each student. At the end of the presentation 5 minute time is allocated to questions. The assessment depends on the style of the presentation, command of the language, confidence of the student, the ability to answer the questions, and the content of the project. Each jury member fills in a separate assessment form. The final grading is taken to be the average grade given by all the jury members.

Table 1 Grading Scheme and Grades

PERCENTAGE	COURSE GRADE	GRADE POINTS
90-100	AA	4.00 (Excellent)
85-89	BA	3,30-3,95 (Excellent)
80-84	BB	3,00-3,45 (Very Good)
75-79	CB	2,50-2,95 (Very Good)
70-74	CC	2,00-2,45 (Good)
65-69	DC	1,50-1,90 (Good)
60-64	DD	1,00-1,40 (Good)
50-59	FD	0,50-0,90 (Failed)
0-49	FF	0,00 (Failed)

5. Occupational Profiles of Graduates

Undergraduate students have many opportunities after graduating. Some of the possibilities are continue a graduate degree, work for engineering and consulting firms, work for government agencies, work for manufacturers of electrical, electronic, and computer and office equipment

For graduate students, career prospects are Public organizations, private companies, semi-government organizations, universities, research institutions, technical high schools, telecommunications companies, defence companies.

6. Programme Director

Assoc. Prof. Dr. Akbar Abbasi (Coordinator)
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7. Key Learning Outcomes

The student who successfully completes the program should be able to

A list of the intended learning outcomes of the bachelor's degree program is given below:

1. Ability to apply mathematics, science, and engineering knowledge to understand electrical engineering related events

2. Ability to design and conduct experiments, and computer simulations, and be able to analyze data.

3. Ability to design electric and electronic devices and products.

4. Ability to work with multi-disciplinary engineering sciences.

5. Ability to identify and solve problems using technical literature for research tasks and system design.

6. Be able to understand professional, ethical responsibilities and standards of engineering practice.

7. Be able to understand the effect of engineering in a global, economic, environmental, and societal setting.

8. Be able to use engineering techniques, skills, and tools for practice and product development.

8. Objectives and Contents of the Course

YEAR 1

General Chemistry (course type: required; course code: CHE105)

Course objective: Develop fundamental principles of theoretical and appliedchemistry. Develop scientific inquiry, complexity, critical thinking, mathematical and quantitative reasoning. Explain phenomena observed in the natural world. Develop basic laboratory skills.

Course content: A basic course with emphasizing the metric system. Introduction to atomic theory, stoichiometry. The structural and physical properties of matter. Periodic relationship among elements and periodic table. Gaseous state. Thermo-chemistry. Energy and enthalpy. Electronic structure of atoms. Chemical bonding.

Calculus I (course type: required; course code: MTH101)

Course objective: The aim is to teach the fundamentals of the mathematical definitions such as integration and derivation.

Course content: Functions, limits and continuity. Derivatives. Mean value theorem.Sketching graphs. Definite integrals, infinite integrals (antiderivatives).Logarithmic, exponential, trigonometric and inverse trigonometric functions and their derivatives. L'Hospital's rule.Techniques of integration.Applications of the definite integral, improper integrals.

General Physics I (course type: required; course code: PHY101)

Course objective: Be able to know the basic laws of mechanics. To apply those lawsfor solving problems.To be able to us his/her knowledge in the fields of other sciences and/or engineering. Understanding how physics approach and solve problems in mechanics.

Course description: Measurement, vectors, kinematics, force, mass. Newton's laws,applications of Newton's laws. Work and kinetic energy.Conservation of linear momentum.Impulse, collisions, rotation, moments of inertia.Torque, angular momentum, conservation of angular momentum, static equilibrium.

Computer Programming (course type: required; course code: CMP101)

Course objective: An introduction to fundamental concepts, construction of digitalcomputer system hardware and software.

Course description: Construction and abstraction of computer program. Structure ofa C program, data types, constants, input and output of integer numbers, real numbers.Arithmetic expressions. Control structures, Procedures. Enumerated types, array records and subscripted variables. Arrays.Files, pointers, linked-lists, queues.

Calculus II (course type: required; course code: MTH102)

Course objective: The aim is to teach the fundamentals of the mathematicaldefinitions such as sequences, Taylor's series, and complex numbers.

Course description: Plane and polar co-ordinates, area in polar co-ordinates, arclength of curves. Limit, continuity and differentiability of function of several variables, extreme values, method of Lagrange multipliers. Double integral, triple integral with applications. Line integrals, Green's theorem.Sequences, infinite series, power series, Taylor's series.Complex numbers. Prerequisite: MAT 101.

General Physics II (course type: required; course code: PHY 102)

Course objective: The aim is to teach the Coulomb's law, Electrical fields, Gauss'slaw, electrical potential Faraday's law of induction and Inductance and inductors.

Course description: Electrical charges. Coulomb's law.Electrical fields.Gauss'slaw. Electrical potential.Capacitance and dielectrics.Current and resistance.Direct current circuits.Magnetic fields.Sources of the magnetic field.Faraday's law of induction.Inductance and inductors.

Prerequisite: PHY 101

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Technical Drawing and Electrical Applications (course type: required; course code: MEC101)

Course objective: The aim is to introduce the fundamentals of engineering drawing

Course description: Fundamentals of engineering drawing, introductory materials,use of instruments, lettering, constructional geometry, orthographic drawing, sectioning, dimensioning, pictorial drawing and sketching, isometric projection, assembly drawing, assembly elements.

Linear Algebra (course type: required; course code: MTH 112)

Course objective: To provide a student with methods for solving systems of linearequations. To introduce the basic properties of determinants and some of their applications.To show that the notion of a finite-dimensional, real vector space is not as remote as it may have seemed when first introduced. To deal with magnitude and direction in inner product spaces. To study linear transformations To consider eigenvalues and eigenvectors and solve the diagonalization problem for symmetric matrices.

Course description: Systems of linear equations and Matrices : elementary rowoperations, echelon forms, Gaussian elimination method, matrices and matrix operations , invertible matrices, diogonal,triangular and symmetric matrices. Determinants: determinants by cofactor expantion ,evaluating determinants by row reduction,adjoint and inverse matrices, Cramer's rule. Euclidean vector spaces: Euclidean n-space, linear transformation from R n to Rm.General vector spaces: Real vector spaces,subspaces, linear independence, basis and dimensions, row space ,column space,andnullspace, rank and nullity. Inner product spaces: inner products, orthogonality in inner product spaces,orthonormalbases,Cauchy-Schwarz inequality, Gram-Schmidt orthogonalization,change of bases,orthogonal matrices. Eigenvalues and eigenvectors: Eigenvalues and eigenvectors,diagonalization,orthogonal diagonalization.

YEAR 2

Circuit Theory I (course type: required; course code: EEE 201)

Course objective: Introduce students the fundamentals of circuit theory.

Course description: System of units. Charge, current, voltage and power.Types ofcircuits and circuit elements.Ohm's law.Kirchhoff’s law.Node analysis. Mesh analysis. Linearity and superposition principles, source transformations, Thevenin and Norton theorems.Inductance and capacitance.Simple and general forms of source-free RL- and RC-circuits. The unit-step forcing function. The natural and forced

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response of the first-order and second-order circuits. Prerequisite: PHY 102

Circuit Theory II (course type: required; course code: EEE202)

Course objective: Continues to introduce students the fundamentals of circuit theory

Course description: The sinusoidal steady-state analysis; the phasor, the passivecircuit elements in frequency domain. Phasor diagrams. Instantaneous power.Average power.The effective (RMS) value.Apparent power and power factor. Complex power and power factor correction. Polyphase circuits.Complex frequency.Parallel resonance, bandwidth and quality factor.Series resonance and other resonant forms. Introduction to Laplace transform. Circuit analysis in the s-domain.Magnetically coupled circuits.Two-port networks. Prerequisite: EEE201

Differential Equations (course type: required; course code: MTH 201)

Course objective: Introducing first, second and higher order differential equations,and the methods of solving these equations. Emphasizing the important of differential equations and its engineering application.Introducing the Laplace transform and its applications in solving differential equations and other engineering applications.Introducing the series method in solving differential equations.

Course description: Differential equations and their solutions: Classification ofDifferential equations; their origin and solutions, Initial value and Baundary value problems and existence of solutions.First order equations: seperable equations and equations reducible this form.Linear equations and Bernoulli equations.Exact differential equations and integrating factors.Higher order linear differential equations:Basic Theory of Linear Differential Equations, The Homogeneous Linear Equation with constant coefficients.The method of Undetermined Coefficients,The Cauchy –Euler equation, Variation of Parameters. Series solutions of linear differential equations.Laplace transform: Definition ,existence and basic properties ,the inverse transform and the convolution,Laplace Transform solution of linear differential equations with constant coefficients, Laplace transform solution of linear differential equations with discontinuous nonhomogeneous terms. Prerequisite: MAT101, MAT 112

Numerical Analysis (course type: required; course code: MTH301)

Course objective: The main purpose of the course is to introduce the studentsintofundamentals of numerical analysis that are mainly used in engineering. The course is focused on techniques of mathematical analysis that can be used in computer algorithms, etc.

Course description: Approximations and errors. Accuracy and precision.Finitedivided difference and numerical differentiation. Roots of equations, bracketing

methods and open methods, systems of nonlinear equations. Systems of linear algebraic equations. Curve fitting, interpolation. Numerical integration.Ordinary differential equations. Prerequisite: MTH201 and MTH112

Computer Applications (course type: required; course code: CMP211)

Course objective: Provide the students with a basic knowledge of MATLAB as aprogramming and simulation environment. Provide students with tools of problems analysis and solving using MATLAB. Provide students with basic understanding of simulation and electrical systems representation

Course description: MATLAB fundamentals. Entering variables, vectors andmatrices. Matrix operations: addition, subtraction, multiplication, division, transpose, inverse and rank of matrices. Matrix manipulations.Elementary logical and mathematical functions. Graphing: X-Y plots, polar and bar plots, 3-D mesh and surface plots. Control flow: FOR loops, while loops, break statements. Script files. CIRCUIT MAKER program.Schematic capture.Macro devices.Digital logic simulations.Analog/mixed mode simulation. Fault simulation.

Electromagnetic Theory (course type: required; course code: EEE216)

Course objective: To provide a student with the necessary tools for the criticalevaluation of existing and future electromagnetic phenomena.To teach the concepts and principles of constructions of electromagnetics.To enable a student to evaluate and choose a electromagnetic tools to match the problem

Course description: Vector analysis. Coulomb's law.Gauss's law.Electricalpotential.Dielectrics.Electric flux.Boundary conditions for electrostatic fields.Capacitance and capacitors.Poisson's and Laplace's equations.Boundary-value problems in Cartesian, cylindrical and spherical coordinates.Current density and Ohm's law.Power dissipation and Joule's law.Vector magnetic potential.Biot-Savart law and applications.The magnetic dipole.Ampere's law.Magnetization and equivalent current densities.Magnetic field intensity and relative permeability.Boundary conditions for magnetostatic fields.Inductance and inductors.Magnetic energy in terms of field quantities.Magnetic forces and torques. Prerequisite: MTH 102 and PHY102

Electronics I (course type: required; course code: EEE 222)

Course objective: Provide students with knowledge of semiconductors and theirapplications. Explain the diodes and their applications. Provide the knowledge of BJTs, their applications and analysis. Explain the different applications and importance of BJT in electronics.

Course description: Semiconductor diodes. Diode applications: switching,rectification, clippers and clampers. DC power supplies.The theory of BJT operation, CB, CE and CC configurations.BJT bias circuits.FET operation and biasing.Small signal BJT and FET analysis using re- and h-parameters.Amplifier frequency response.
Prerequisite: EEE201

Electrical Materials (course type: required; course code: EEE241)

Course objective: The primary purpose of this course is to provide an introduction tothe interrelation of the structure, properties and processing of electrical and electronic materials, with an emphasis on the first two.

Course description: Introduction to quantum mechanics; crystal structures, energylevels in crystals; quantum physics of metals, electron transport in metals. Superconductivity.Semiconductors; impurities; carrier transport in semiconductors; generation and recombination of minority carriers.The p-n junction diode. Light sensitive materials; photodiodes; light-emitting diodes. The bipolar junction and field effect transistors. Characteristics of dielectric materials and devices; magnetic fields and characteristics of magnetic materials.Thermal effects. Prerequisite: CHE 105

Complex Analysis (course type: required; course code: MTH 341)

Course description: Periodic functions, Fourier series expansion. Fourier integralrepresentation.Laplace transformation.Laplace transformation of periodic functions.Convolution theorem.Complex numbers. Analytic functions. Elementary functions. Integrals.Series.Residues and poles.Mapping and elementary functions. Prerequisite: MTH102

YEAR 3

Probability and Statistics (course type: required; course code: MTH312)

Course objective: Understanding the concept of data analysis. Understanding theconcept of probability and the concept of random variables.Understanding the difference between discrete and continuous random variables.Understanding the concepts of expectation, variance and standard deviation.Understanding the concepts of probability mass functions and cumulative distribution function for discrete, continuous and joint distributions.Understanding and learning the different types of discrete and continuous distributions.

Course description: Definition of probability. Sample space and events.Permutations and combinations.Conditional probability and Bayers theorem.Random variables.Discrete and continuous distributions.Moment generating function.Expectation, variance, covariance and correlation. Condition densities and

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regression and transformation of variables. Descriptive statistics. Prerequisite: MAT 102

Microprocessors (course type: required; course code: EEE302)

Course objective: Teaching the microprocessor as a programmable digital systemelement. To illustrate some basic concepts of microprocessors through the use of assembly language programming.To give the principles of hardware design. To provide an understanding of a microprocessor based system as a combination of hardware and software subsystems and their interactions

Course description: Microprocessor fundamentals. Instruction sets andarchitectures for typical microprocessors. Addressing techniques.Assembly language programming.Memories structures.Input-output devices.Design of microprocessor systems.
Prerequisite: EEE 315

Electrical Measurements (course type: required; course code: EEE 220)

Course objective: The students will be familiar with various measuring instrumentsused to detect electrical quantities.

Course description: Measurement and errors, systems of units of measurements.Standards of measurements. Electromechanical indicating instruments.Bridge circuits.Comparison measurements.Oscilloscopes.The basics of digital instruments.Data converters.Intelligent instruments.Measurement transducers. Prerequisite: EEE 201

Logic Circuit Design (course type: required; course code: EEE 315)

Course objective: This course introduces students to the fundamentals of digitallogic and design and construction, testing and debugging of digital circuits.

Course description: Number systems and codes. Algebraic methods for the analysisand synthesis of logic circuits. Simplification of switching functions. Combinational logic circuits.Flip-flops.Counters, registers.Arithmetic circuits.Analysis and synthesis of synchronous sequential circuits. Prerequisite: EEE 222

Electronics II (course type: required; course code: EEE321)

Course objective: To provide a general background of semiconductors to thestudents. To provide physical and electrical properties of basic electronic devices; diodes, transistors, operational amplifiers. To provide the analysis of basic diode, transistor and operational amplifier circuits. To provide the analysis of instrumentation amplifiers.

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Course description: Multistage amplifiers: methods of coupling, multistage BJT andFET amplifiers, differential amplifiers. Operational amplifier theory, basic op-amp circuits: voltage comparators, summing amplifiers, integrators and differentiators, controlled current and voltage sources, instrumentation amplifiers. Oscillators.Active filters.Power amplifiers. Prerequisite: EEE 222

Linear Control Systems (course type: required; course code: EEE 324)

Course description: Mathematical modelling of control systems: differentialequations, Laplace transforms, state equations. Transfer functions, block diagrams, signal flow graphs. Stability.Routh-Hurwitz criterion.Frequency domain analysis. Bode diagram. Nyquist criterion. Root locus method. State-space analysis.Design of control systems.Compensation techniques.Decomposition of Kalman.Controllability and observability of systems. Prerequisite: MAT 201

Electromechanical Energy Conversion I (course type: required; course code: EE 331)

Course objective: Introduces students to the fundamentals of electrical machinery.

Course description: Magnetic circuits and magnetic materials; Properties ofmagnetic materials, magnetic induction, Faraday's law, Energy losses. Transformers; No-load conditions.Ideal transformers, transformer reactance and equivalent circuit.Three-phase transformers.Efficiency and voltage regulation. DC machines: Commutator action, structure of DC machines, types of DC machines. Prerequisite: EEE 216

Electromechanical Energy Conversion II (course type: required; course code: EE 332)

Course objective: Continues to introduce students the fundamentals of electricalmachinery.

Course description: Rotating fields. Induced emf.Cylindrical rotor synchronousgenerator.Synchronous impedance.Armature reaction. Phasor diagrams. V curves. Salient pole synchronous generators.Direct axis and quadrature axis reactances. Phasor diagrams in parallel running of synchronous generators. Load distribution between interconnected synchronous generators. Synchronous motors. Three phase asynchronous machines. Circle diagrams. Single phase (fractional horse-power) motors.
Prerequisite: EE 331

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Signals and Systems (course type: required; course code: EEE341)

Course objective: This course introduces students to the study and analysis ofsignals and systems.

Course description: Properties of continuous and discrete-time signals andsystems. Basic signal modifications. Memory, causal, stable, linear and time-invariant systems.Stochastic processes and noise.Impulse response, transfer function.Convolution.Fourier series and transforms. Laplace transform. Sampling and modulation.Interpolation methods.Filtering.Orthogonal expansion of signals.Z-transform.Mapping s-plane into z-plane.Inverse Z-transform. Prerequisite: EEE202

Communication Systems (course type: required; course code: EEE346)

Course objective: This course is an introduction to the basic principles underlying the design and analysis of analog communication systems.

Course description: Elements of communication systems. Communication channels. AM, FM and PM modulations. Spectrum of signals. Modulators and demodulators. Phase-locked loop method. Comparison of the analog modulation systems. Noise types and noise measurement. Effect of noise on the analog communication systems.Multiplexing methods. Butterworth, Chebyshev and Bessel filters. Broadcasting.Superheterodyne receiver.AM radio, FM stereo radio and television systems. Mobile radio systems. Prerequisite: EEE 341

YEAR 4

Telecommunications (course type: elective; course code: EEE 411)

Course objective: The purpose of this course is to introduce fourth year electricalengineering students to the area of digital communications. It focuses on the technologies supported by these systems

Course description: Digital transmission systems. Binary ASK, FSK and PSKmodulation. Spectrum of signals. Coherent and incoherent receptions.Modems.Pulse-code modulations. The telephone set and subscriber loop. Time division and frequency division multiplexing hierarchy. Public switching telephone network.Cordless telephone.Mobile telephony.Forward error correction systems. Hamming code, Syndrome decoding, Linear code, cyclic codes, convolutional codes. ARQ systems. Spread spectrum systems. Basic elements of satellite communication systems.
Prerequisite: EEE346 Technology

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Radar Systems (course type: elective; course code: EEE442)

Course description: General design principles and performance evaluation ofpulsed radars. Statistical detection theory and radar cross-section of targets.CW, FM and Doppler radars.Target tracking radars.Radar receiver design.High power microwave generation and amplification; Radar antennas.Detection of radar signals in noise and waveform design.Propagation of radar waves. Prerequisite: EEE 346

Computer Networking (course type: elective; course code: CMP/EEE416)

Course objective: Build an understanding of the fundamental concepts of computer networking. Familiarize the student with the basic taxonomy and terminology of the computer Networking area. Introduce the student to advanced networking concepts, preparing the student for Entry Advanced courses in computer networking. Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

Course description: Network topologies. Packet transmission. Switching techniques.LAN topology, interface, repeaters, bridges. WAN and routing. Wireless networks. Introduction to remote procedure calling.Client/Server computing.Internetworking, architecture and protocols. IP protocol addresses. Encapsulations, fragmentations and reassembly. Error reporting mechanism.TCP. Encryption and message security.

Neural Networks (course type: elective; course code: CMP/EEE420)

Course objective: Teaching the basics of neural networks. To illustrate the basicapplications of neural networks using Matlab. To give the principles of neural networks approaches.

Course description: Introduction to Neural Networks; definitions, history, analogy tobiological brain. Neural Networks architecture and learning methods; Hebb's theory, Supervised/Unsupervised Learners; the Perceptron, Hamming network, Hopefield network, Kohonen self-organising network, competitive learning, Back propagation algorithm. Neuron activation functions. Adaline network and XOR-Problem.Training by error minimization.Feedback and Recurrent networks.Mathmatica and MATLAB Software used for neural network simulation during laboratory work.

Electromagnetic Wave Propagation and Antennas (course type: elective; course code: EEE469)

Course objective:

Course description: Maxwell's equations and coordinate systems. Wave equations.Green's functions, radiation. Ideal dipole. Doppler effect. Basic antenna performance parameters. Line sources and wire antenna. Broadband antenna. Array theory

Aperture theory.Frequency independent antennas.Antenna measurements. Prerequisite: EE 216

Process Control Instrumentation Technology (course type: elective; course code: EEE 424)

Course description: Process control characteristics. Analog and digital signalsconditioning. Thermal, mechanical, optical sensors and design considerations. Final control.Discrete-state process control.Controller principles.Controllers. Control loop characteristics. Industrial control networks. Servomotor technology in motion control systems. Robots. Prerequisite: EEE 321 and EEE 324

Programmable Logic Controllers (course type: elective; course code: EEE470)

Course objective: Introduction to programmable logic controllers.

Course description: Basic principles of PLC. Operation of PLC.Programmingtechniques.Basic logic instructions.Programming by statements, programming by ladder symbols.Timer, counter, special control instructions.Designing logic control circuit diagrams.Industrial applications. Prerequisite: EE 315

Satellite Systems (course type: elective; course code: EEE 425)

Course objective: This course covers the basic techniques for the design andanalysis of satellite communication systems.

Course description: Elements of satellite communication systems. Orbits and theirdescriptions.Frequency bands.Earth station.Antennas, amplifiers, up converter, down converter.Transponder.Satellite link analysis.FDMA, TDMA access.Satellite TV broadcasting systems.Satellite packet communication.VSAT configurations. Prerequisite: EE 346

Information Theory and Coding (course type: elective; course code: EE E427)

Course objectives: Topics include entropy and information, information channels,source coding, fundamentals of channel coding, cyclic codes and convolutional codes.

Course description: The concepts of source and channel. Measure of information.Entropy. Channel capacity. Gaussian binary symmetrical channel.Source coding theorem.Huffman coding.Linear codes.Error detection and correction codes.Hamming code.BCH code.Cyclic codes. Design of error detection and err correction systems. Prerequisite: EEE341, MTH350

Communication Electronics (course type: elective; course code: EEE 428)

Course description: Analog communication circuits: amplifiers, filters, oscillators,VCO, PLL circuits. Digital communication circuits: encoders, decoders. Modulators and demodulators. Prerequisite: EE 346

Mobile Communications (course type: elective; course code: EEE 429)

Course description: Introduction to cellular mobile systems; Elements of cellularradio system design; Specifications of Analog Systems; Cell coverage and propagation; Cochannel interference; Frequency management and channel assignment; Hand-offs and Dropped calls; Switching and Traffic; System evaluations; Digital cellular systems; Intelligent cell and intelligent network. Prerequisite: EE 346

Wireless and Personal Communications Systems (course type: elective; course code: EEE 430)

Course description: Cellular communication concepts. Roaming.Cells splitting.Access technology.Architecture of mobile switching center. Mobile and base stations call processing. Authentication.Encryption and information security in mobile systems.North American, Japanese and European cellular systems.Iridium-66 and globstar-48 systems. Prerequisite: EEE 346

Digital Control Systems (course type: elective; course code: EEE 454)

Course description: Introduction to sampled data systems. Discrete modelling ofsystems.Z-transforms. Second order discrete systems. Stability. Root-locus in the z-plane, Bode diagrams in the z-plane, Nyquist diagrams in the z-plane. Compensation techniques.PID-controllers. Prerequisite: EE 324

Mechatronics (course type: elective; course code: EEE432)

Course description: Introduction to Mechatronics and measurement systems.Sensors and transducers: Sensors and transducers, Performance terminology, Examples of sensors, Selection of sensors. Signal conditioning: Signal conditioning, The operational amplifiers for analog signal processing, Protection, Filtering, Digital circuits and systems. Measurement systems: Designing measurement systems, Data

presentation systems, Measurement systems, Testing and calibration. Mechanical actuation systems: Mechanical systems, Kinematic chains, Cams, Gear trains, Ratchet mechanisms, Belt and chain drives. Electrical actuation systems: Electrical systems, Switches, Solenoids, Motors, Stepping motors. Basic system models: Mathematical models, Mechanical system building blocks, Electrical system building blocks, Fluid system building blocks, Thermal system building blocks. Simulation of simple mechanical systems by electrical elements (circuits). Design and mechatronics: Designing, Mechanisms, Examples of designs. Prerequisite: EE 324

Digital Electronics (course type: elective; course code: EEE451)

Course description: Introduction to ICs. Logic families.Small- and large-scaleintegrations.Decoders, multiplexers, memories.Programmable logic devices.Digital-to-analog and analog-to-digital converters. Prerequisite: EE 315

Robotics (course type: elective; course code: EEE457)

Course description: Components and subsystems: vehicles, manipulator arms,wrists, actuators, sensors, user interface, controllers. Classifications of robots. Coordinate transformations. Dynamic model of robots. Kinematics: manipulator position, manipulator motion. Sensors, measurement and perception.Computer vision for robotics.Hardware and software considerations. Prerequisite: EE 324

Digital Signal Processing (course type: elective; course code: EEE461)

Course description: Discrete-time signals and systems. Realization of discrete-timesystems. Discrete Fourier transform. FIR and IIR filters. Cyclic limit.Synthesis of filters. Bilateral transform windowing. Prerequisite: EE 341

Image Processing (course type: elective; course code: EEE463)

Course objective: Teaching the basics of image processing, illustrating the basicapplications of image processing using Matlab and giving the principles of image enhancement approaches

Course description: Mathematical model of image. Image acquisition, sampling andquantizing.Enhancement and restoration of image.Image coding and compression techniques.Image recognition.Practical aspects of image processing. Prerequisite: EE 341

Power Electronics (course type: elective; course code: EEE433)

Course objective: Power electronics Fundamentals

Course description: Power semiconductor devices: power diodes and transistors,thyristors, GTOs, power MOSFETs. Drive circuits and switching characteristics. AC-DC Converters: single-phase half-wave converters, two-phase mid-point converters, single- and three-phase bridge converters, three-phase mid-point converters. Line-current harmonics.Firing control of rectifiers. DC choppers: single- and two-thyristor choppers. Inverters: single- and three-phase square-wave inverters, voltage control of inverters, PWM inverters. Prerequisite: EEE 321 and 332

Power System Analysis I (course type: elective; course code: EEE 471)

Course objective: Introduction to transmission lines and power system modeling

Course description: General structure of electric power systems. Electricalcharacteristics of transmission lines, transformers and generators: series impedance and capacitance of transmission lines, current-voltage relations on a transmission line for short, medium and long lengths. System modelling of synchronous machines, transformers, transmission lines and loads.Representation of power systems.Per unit analysis of power systems.Power circle diagram.Travelling waves, reflections. Symmetrical three-phase faults. Symmetrical components.Unsymmetrical components.
Prerequisite: EEE 331

Power System Analysis II (course type: elective; course code: EEE472)

Course objective: To teach Symmetrical Components for analyzing unbalancedvoltage and current phasors. The aim is analyzing Unbalanced Faults on Unloaded Generators, teaching unsymmetrical Fault Analysis on Power Systems and studing Load Flow on Power Systems.

Course description: Network calculations. Bus admittance and impedance matrices.Load-flow solutions and control.The Gauss-Seidel method.The Newton-Raphson method.Control of power into a network.Economic operation of power systems.Distribution of load between units within a plant. Transmission loses as a function of plant generation. Penalty factors.Symmetrical components. Unsymmetrical faults. System protection.Power system stability. Prerequisite: EEE 471

Power System Protection (course type: elective; course code: EEE 473)

Course description: Current and voltage transformers. Over current protection. .Comparators and static relay circuits. Differential protection.Motor protection. Pilot wire protection of feeders. Introduction to distance protection systems.
Prerequisite: EEE 471

Static Power Conversion 3 (course type: elective; course code: EEE 474)

Course description: Power switches. Power converters.VTA method.Midpoint andbridge rectifiers.Introduction to forced commutated circuits.Centretap inverter.Voltage-fed inverters.Current-fed inverters.DC-DC switching converters.Series and parallel operation of switching elements. Prerequisite: EEE 433

High Voltage Techniques I 3 (course type: elective; course code: EEE 475)

Course description: Ionisation and decay processes: photo-ionisation, ionisationbyinteraction of metastables with atoms, thermal ionisation, electron detachment, decay by recombination, decay by attachment-negative ion formation, cathode processes, Townsend's ionisation coefficients and electric breakdown in gases. The Townsend criterion for breakdown, breakdown voltage.Steamer mechanism, breakdown voltage characteristics in uniform fields, the Penning effect, breakdown in compressed gases.Paschen's law, Corona discharge, breakdown in non-uniform field.Breakdown mechanism in solids and liquids.

High Voltage Techniques II 3 (course type: elective; course code: EEE 476)

Course description: Generation of high voltages. Alternating voltages.Transformersin cascade.The series resonant circuit for high voltage AC testing.Transient voltages.Single-stage and multistage impulse generator circuits, tripping of an impulse generator and synchronisation with oscilloscope. Direct Voltages.

Voltage doubler and cascade circuits.Electrostatic machines.Voltage stabilisation. Prerequisite: EEE 475

Distribution Systems Techniques 3 (course type: elective; course code: EEE 478)

Course description: Basic considerations. Load characteristics and forecastingmethods. Distribution substations.Operational characteristics of cables and transformers.System voltage regulation.Power factor correction. Fuse gear, switch gear, current and voltage transformers. Over current and thermal protection.Earthing methods.Economics of distribution systems. Prerequisite: EEE 471

Illumination Engineering 3 (course type: elective; course code: EEE 492)

Course description: Light, units. Vision. Light sources: incandescent lamps, mercuryvapour lamps, sodium vapour lamps, HQ lamps. Illumination: indoor lighting calculations, outdoor lighting calculations, road lighting calculations. Prerequisite: EEE 331

Economics for Engineers (course type: elective; course code: EAS 431)

Course description: Principles and economic analysis of engineering decisionmaking. Cost concept. Economic environment.Price and demand relations.Competition.Make-versus-purchase studies.Principles and applications of money-time relations.Depreciation.MONEY and banking.Price changes and inflation. Business and company finance.

9. Information on the National Higher Education Systems

The basic structure of the North Cyprus Education System consists of four main stages as pre-school education, primary education, secondary education and higher education.

Pre-school education consists of non-compulsory programs whereas primary education is a compulsory 8 year program for all children beginning from the age of 6. The secondary education system includes "General High Schools" and "Vocational and Technical High Schools".

The Higher Education System in North Cyprus is regulated by the Higher Education Planning, Evaluation, Accreditation and Coordination Council(YükseköğretimPlanlama, Denetleme, AkreditasyonveKoordinasyonKurulu , YÖDAK). Established in 1988, the Council regulates the activities of higher education institutions with respect to research, governing, planning and organization. The higher education institutions are established within the framework of the Higher Education Law. All programs of higher education should be accredited by YÖDAK.

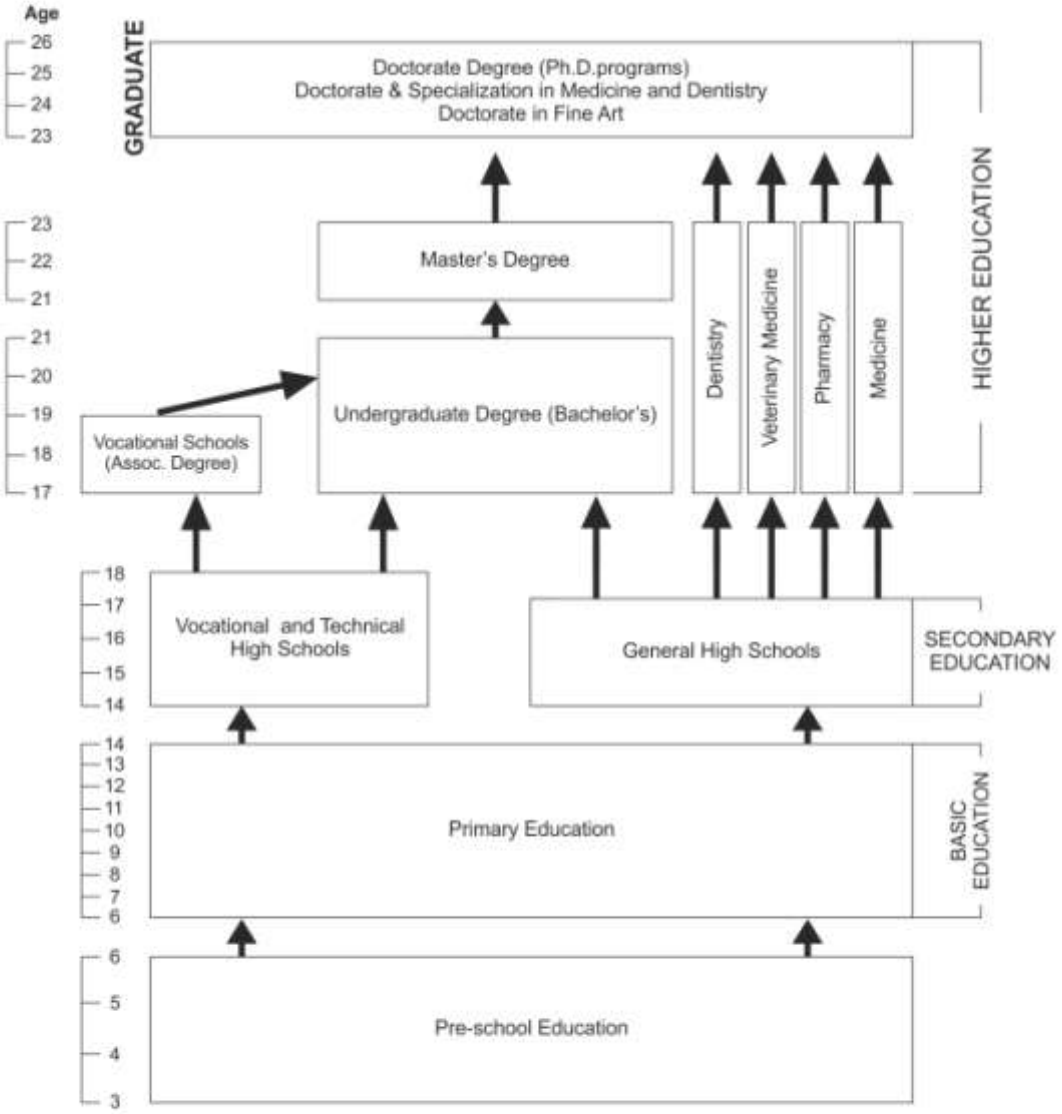
Higher education in North Cyprus comprises all post-secondary higher education programmes, consisting of short, first, second, and third cycle degrees in terms of terminology of the Bologna Process. The structure of North Cyprus higher education degrees is based on a two-tier system, except for dentistry, pharmacy, medicine and veterinary medicine programmes which have a one-tier system. The duration of these one-tier programmes is five years except for medicine which lasts six years. The qualifications in these one-tier programmes are equivalent to the first cycle (bachelor degree) plus secondary cycle (master degree) degree. Undergraduate level of study consists of short cycle (associate degree) and first cycle (bachelor degree) degrees which are awarded after the successful completion of full-time two-year and four-year study programmes, respectively.

Graduate level of study consists of second cycle (master degree) and third cycle (doctorate) degree programmes. Second cycle is divided into two sub-types named as master without thesis and master with thesis. Master programmes without thesis consists of courses and semester project. The master programmes with a thesis consist of courses, a seminar, and a thesis. Third cycle (doctorate) degree programmes consist of completion of courses, passing a qualifying examination and a doctoral thesis. Specializations in dentistry, accepted as equivalent to third cycle programmes are carried out within the faculties of dentistry. Specialization in medicine, accepted as equivalent to third cycle programmes are carried out within the faculties of medicine, and university hospitals and training hospitals operated by the Ministry of Health.

Universities consist of graduate schools (institutes) offering second cycle (master degree) and third cycle (doctorate) degree programmes, faculties offering first cycle (bachelor degree) programmes, four-year higher schools offering first cycle (bachelor degree) degree programmes with a vocational emphasis and two-year vocational schools offering short cycle (associate degree) degree programmes of strictly vocational nature.

Second cycle degree holders may apply to third cycle programmes if their performance at the first cycle degree level is exceptionally high and their national central Graduate Education Entrance Examination (ALES) score is also high and their application is approved. The doctoral degree is conferred subject to at least one publication in a cited and refereed journal.

GENERAL STRUCTURE OF THE NORTH CYPRUS EDUCATION SYSTEM



APPENDIX

FACULTY OF ENGINEERING
ELECTRIC AND ELECTRONIC ENGINEERING

1st Semester								2nd Semester							
Fall Semester								Spring Semester							
Course Code	Course Name	T	U	L	Cred.	ECTS	Pre	Course Code	Course Name	T	U	L	Cred.	ECTS	Pre
CHE105	General Chemistry	3	0	2	4	6		ENG102	English II	3	0	0	3	4	ENG 101
ENG101	English I	3	0	0	3	4		MTH102	Calculus II	4	0	0	4	6	MTH101
MTH101	Calculus I	4	0	0	4	6		MTH112	Linear Algebra	3	0	0	3	5	MTH101
PHY101	Physics I	3	0	2	4	6		PHY102	Physics II	3	0	2	4	6	PHY101
CMP101	Computer Programming for Engineers	2	0	2	3	5		MEC101	Technical Drawing I	2	0	2	3	5	
EEE100	Electric and Electronic Engineering Orientation	2	0	0	0	3		EEE102	Introduction To Electric And Electronics	3	0	0	3	4	
	TOTAL				21	30			TOTAL				20	30	

3rd Semester								4th Semester							
Fall Semester								Spring Semester							
Course Code	Course Name	T	U	L	Cred.	ECTS	Pre	Course Code	Course Name	T	U	L	Cred.	ECTS	Pre
EEE201	Circuit Theory I	3	0	2	4	6	PHY102 MTH101	EEE202	Circuit Theory II	3	0	2	4	6	EEE201
CMP203	Computer Applications	2	0	2	3	5		EEE205	Electromagnetic Theory	3	0	0	3	5	MTH102
EEE203	Electrical Materials	3	0	0	3	5	CHE105	EEE229	Electrical Measurements	2	0	2	3	5	EEE201
ENG213	English Communication Skills	3	0	0	3	4	ENG102	EEE222	Electronics I	3	0	2	4	6	EEE201 EEE243
MTH203	Differential Equations	4	0	0	4	6	MTH102	EEE300	Summer Training I				0	5	
AIT201	Atatürk's Principles and History of Turkish Revolution I	2	0	0	2	2		AIT202	Atatürk's Principles and History of Turkish Revolution II	2	0	0	2	2	AIT101
TDB201	Turkish I: Written Expression	2	0	0	2	2		TDB202	Turkish II: Oral Expression	2	0	0	2	2	TDB101
*PED201	Turkish I for foreign students							*PED202	Turkish II for foreign students						
	TOTAL				23	30			TOTAL				26	30	
*RTE	Turkish I for foreign students	4	0	0	4	4		*RTE (YIT102)	Turkish II for foreign students	4	0	0	4	4	

5rd Semester								6nd Semester							
Fall Semester								Spring Semester							
Course Code	Course Name	T	U	L	Cred.	ECTS	Pre	Course Code	Course Name	T	U	L	Cred.	ECTS	Pre
EEE 305	Logic Circuit Design	2	0	2	3	5	EEE222	EMP304-3	Microprocessor	3	0	2	4	5	EEE 305
EEE 323	Electronics II	3	0	2	4	5	EEE222	EEE324	Linear Control Systems	3	0	0	3	5	MTH102
EEE 303	Electromechanical Energy Conversion I	3	0	2	4	5	EEE 202 EEE205	EEE 306	Communication Systems	4	0	0	4	5	EEE 302
EEE342	Signals and Systems	3	0	2	4	6	MTH203	MTH312	Probability and Statistical Methods	3	0	0	3	5	MTH102
MTH303	Numerical Analysis for Engineers	3	0	0	3	5	MTH203	EEE302	Electromechanical Energy Conversion II	3	0	2	4	5	EEE 303
MTH343	Complex Analysis	3	0	0	3	4	MTH203	EEE300	Summer Training II				0	5	
	TOTAL				23	30			TOTAL				26	30	

7th Semester								8nd Semester							
Fall Semester								Spring Semester							
Course Code	Course Name	T	U	L	Cred.	ECTS	Pre	Course Code	Course Name	T	U	L	Cred.	ECTS	Pre
EEE400	Graduation Project I	2	0	0	2	4		EEE402	Graduation Project II	2	0	0	2	4	
MTE3/EEE420	Economics for Engineers	3	0	0	3	5		MTE2	Non-Technical Elective	3	0	0	3	5	
TE3	Technical Elective	3	0	0	3	5		TE5	Technical Elective	3	0	0	3	5	
TE2	Technical Elective	3	0	0	3	5		TE6	Technical Elective	3	0	0	3	5	
TE3	Technical Elective	3	0	0	3	5		TE7	Technical Elective	3	0	0	3	5	
TE4	Technical Elective	3	0	0	3	5			TOTAL				14	25	
	TOTAL				17	30									

TE (ECTS)	48
NTE (ECTS)	12
EC (ECTS)	60
AKTS (ECTS)	60
Total (ECTS)	240
Total (kredi)	150