UNIVERSITY OF KYRENIA

DEPARTMENT OF MECHANICAL ENGINEERING

Course Catalogue

Contents

This course catologue is developed to give information about the mechanicalengineering 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 Computer Engineering and the course programme.

Prof. Dr. Jahid Kerimov
Program Coordinator

Mechanical Engineering (ME) Programme

1. General Information about the Department of Mechanical Engineering

The aim of the mechanical engineering department is to prepare engineering candidates for various branches of industry with an improved self-confidence and individual initiative. Students are educated to have scientific systematic approach in solving engineering problems, sound engineering base, life-long learning habits and research abilities

Our programme has been designed to give students both a theoretical and a practical understanding of the fundamental issues related to mechanical engineering. The programme is well structured and has been designed with the aim of providing an excellent foundation in many areas of the mechanical engineering applications. The programme offers courses in the fields like basic sciences, materials, production, mechanics, thermodynamics, heat transfer, fluid mechanics and mechanical design. In addition, the program aims to teach and develop the leadership skills of students so that they can take managerial positions and be leaders in their future careers.

Graduates of the Department of Mechanical Engineering can find employment in industry, in the departments including production, maintenance, quality control, design and management, in companies giving engineering services and mechanical consultancy, in power plants, in the field of accessing sources of energy such as petroleum, gas, sunlight and wind, in metal production plants and foundaries and many others.

Mechanical Engineering Department currently offers the following programs:

- BS Degree in Mechanical Engineering

The medium of instruction is English.

Vision

The Department of Mechanical Engineering will be nationally recognized as having one of the best undergraduate and graduate programs in the nation. Based on the quality and balance of its undergraduate and graduate programs and research it will be a department of choice by prospective students, parents, faculty, staff, corporate donors, and corporate employees worldwide.

Mission

The mission of the Department of Mechanical Engineering has three tenets that center on the principle of improving lives and livelihoods: to create knowledge through research in the science and technology of mechanical engineering; to share knowledge through educational programs and the dissemination of our new discoveries; and to develop the professional potential of faculty, staff, and students.

Mode of Study and Type of program

The Bachelor's degree program is classified as a full time program. The Bachelor's degree program is aimed at Turkish, Cypriots and Foreign students, and teaching is given in English language. Studies in foreign universities can be included in the student's degree in University of Kyrenia, if they are suitable to substitute studies in the UoK degree program.

Official length of programme:

Length of the program is 4 years (excluding one year of English preparatory class), 2 semesters per year, 16 weeks per semester

Profile of the Programme and Method of Education

Undergraduate curriculum according to Academic Regulation for Undergraduate Studies is arranged by the Mechanical Engineering Department and becomes effective upon the decision of the Engineering Faculty Board and approval of the University Senate.

The Mechanical Engineering Program takes four years and leads to a Bachelor's degree of Science in Mechanical Engineering. The Bachelor's degree requires the completion of 240 ECTS credits. The curriculum of the Bachelor's Degree in Mechanical Engineering was planned according to recommendations of ASIIN's subject-specific criteria. The curriculum is classified into curricular categories represented in Table 1.

Table 1: Curricular categories of the program

Category	Notation	Credit	Weight, %
Mathematics	MT	18	12.50
Basic Science	BS	18	12.50
English Composition & Social Science	ECS	15	10.42
Obligatory Mechanical Engineering Courses	OCE	71	49.30
Technical Elective Mechanical Engineering Courses	TE	18	12.50
Bachelor's Thesis	BT	4	2.78
Summer Internship	SI	-	-
Total		144	100

A number of credits and a weight of a category in the program are indicated in Table 1. It includes studies of mathematics and science, studies of English and social science courses, studies of mechanical engineering obligatory courses, studies of mechanical engineering technical electives courses, bachelor's thesis and practical training.

Teaching methods: The Bachelor's program is full-time, on-campus program. The teaching methods applied in the Degree Program in Mechanical Engineering include lectures, classroom and laboratory exercises, computer training, different kinds of assignments, seminars, excursions, and Case-exercises. The courses also involve group and project work which train the social competences of the students.

The Department of Mechanical Engineering appreciates modern concepts and new methods in teaching and education methods that support educational objectives in addition to traditional methods. Traditional class attendance is compulsory for all courses except graduation

projects. Problem solving sections of knowledge based courses are integrated with the theory sections.

The Department of Mechanical Engineering aims to reach its educational objectives by using several teaching methods. Both the traditional and modern teaching methods are employed at the department. Traditional teaching methods are face-to-face lectures and are class based,requiring all students to attend classes. At least 70% of class attendance is compulsory for all the courses. Lectures are conducted using standard computer based presentations in the form of pre-prepared slides. In addition, white boards and marker pens are used whenever necessary in order to explain difficult topics in greater detail, or to answer student questions. Students are encouraged to take notes during the presentations and ask questions if there are points that they are not clear about. Electronic copies of the slides are sent to students by e-mail after each class, and students are encouraged to go through the slides in their own time and make sure that they understand all presented information.

The degree programme intends to prepare students and graduate them with a number of abilities and skills. The intended learning outcomes of the degree program have been clearly defined and are accessible to all relevant stakeholders, especially to teachers, trainers, lecturers, and students. These outcomes are valid and based on currently accepted technical developments in mechanical engineering. The intended learning outcomes and the requirements to achieve them have been made transparent to the learners. Students and prospective students can find the learning outcomes on the web site of the department. Formal mechanisms are in place for the periodic review and monitoring of the degree programme. Students are assessed using the published criteria to ensure that the learning outcomes intended by the degree programme have all been achieved. Student achievements have been measured and monitored constantly to make sure that they are competent to take up qualified employment after graduating from the degree programme.

2. Access requirements

The admissions requirements are setup in such a way that it supports the students in reaching the intended programme learning outcomes by the end of the 4-year study period at the Department of Mechanical Engineering.

The admissions and entry requirements ensure that the students who are admitted to the degree programme possesses the required competences and formal training required to be able to follow the degree programme successfully. These requirements ensure that all admitted students are treated equally.

Students admitted to the department come from three sources:

- Local students, who are citizens of the Turkish Republic of Northern Cyprus (TRNC)
- Students from Turkey, who are Turkish citizens
- Students from other countries (Foreign students)

All students are admitted to the university after they complete their high school studies successfully and obtain high school graduation diplomas.

Local students must sit for the University of Kyrenia entrance examination and obtain a pass mark from this examination. Successful students are admitted to the university, but not necessarily to the Department of Mechanical Engineering.

Students from Turkey must select the University of Kyrenia and the Department of Mechanical Engineering as their choice, and they must obtain successful pass marks from the Turkish university entrance examinations (prepared and administered by the Higher Education Council of Turkey, YOK). Those who obtain the required marks are admitted to the university, but not necessarily to the Department of Mechanical Engineering. Students from other countries are admitted to the university based on the results of their high school graduation diplomas.

Because the medium of teaching is in English, the level of their English is assessed by the Faculty of English language. Those students who have certificates and who have already passed English Language proficiency examinations are exempt from the English preparation school and are admitted directly to the department where they are enrolled for the first year and first semester of their studies. Those students whose levels of English writing and communication skills are below the required standards are admitted to the English preparatory school of the university. The English preparatory school offers concentrated teaching of the English language reading, writing, and communication skills. The duration of the preparatory school is one academic calendar. Successful students are admitted to the department at the end of their studies at the English preparatory school.

3. Qualification Requirements

157 University of KyreniaCredits (University of Kyrenia Credit is contact hour based) which is total 240 ECTS credits must be completed after being successful in the courses to become a graduate of the Mechanical 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.

Arrangements for transfer from another Computer 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, Mechanical 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 profile of graduates

The perspectives of job market are quite wide due to wide range of international and national students in the department. For this reason, the degree programme offered by the department aims to train students in the general field of mechanical engineering, prepare them for any kind of career in related jobs and also for post-graduate studies. The students find the opportunity to select a wide range of elective courses in their area of interest.

The graduates can find employment in industry, in the departments including production, maintanence, quality control, design and management, in companies giving engineering services and mechanical consultancy, in power plants, in the field of accessing sources of energy such as petroleum, gas, sunlight and wind, in metal production plants and foundaries and many others.

Informal observations are showing that most of the graduates had no difficulty in finding employment. The graduates continuing their studies cannot be underestimated. Limited number of graduates and close student-lecturer relations enabled the department to gather information from graduates. However, a formal mechanism must be adopted for further observations since the number of graduates is increasing.

A summer practice is included in the Bachelor's degree. The total value of obligatory summer practice is 4 ECTS credits in the Bachelor's degree. A summer practice is lasted 40 working days.

The summer practice in the Bachelor's degree is typically so called engineering training. The objective of the engineering training is that the student, working as a member of a work community, gets an idea of paid work. After completing his/her engineering training, the student is able to define and explain, what it is like to be working as an employee, and what are the basic rules in working life from the view of an employee. He/she can anticipate how to act in various situations in a work community. All work assignments can be included in the engineering training.

6. Programme Director

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7. Key Learning Outcome

The intended learning outcomes of the degree programme are achieved with careful selection of the individual modules and the module objectives that form part of the teaching objectives. The individual modules are described in detail on the web site of the university. Students and lecturers are encouraged to use the descriptions as a guide for each individual module. Further study is required for the documentation of the learning outcomes of the modules.

Learning outcomes of the BSc program include development of:

1. Ability to understand and apply knowledge of mathematics, science, and engineering
2. Ability to analyze a problem, identify and define the computing requirements appropriate to its solution.
3. Ability to apply mathematical foundations, algorithmic principles, and mechanicalengineering techniques in the modelling and design of computer-based systems.
4. Ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social aspects
5. Planning and carrying out experiments, as well as to analyze and interpret data
6. Ability to use the techniques, skills and modern engineering tools necessary for engineering practice
7. Understanding of professional, ethical, legal, security and social issues and responsibilities that apply to engineering
8. Ability to work productively in a multidisciplinary team, in particular to carry out projects involving Mechanical engineering skills
9. Ability to communicate effectively with a range of audiences
10. A recognition of the need for, and an ability to engage in life-long learning

The modules' contribution within the learning outcomes of the program was classified with terms very low (1), low (2), moderate (3), high (4) and very high (5). Lecturers of the modules participated in the description and classification work.

8. Courses List with University of Kyrenia credits and ECTS

The curriculum is based on achieving the intended learning outcomes at the end of the 4-year study at the department. The curriculum and detailed content of the degree program are given in Appendix.

9. Objectives and contents of the course:

The educational objectives of the Degree Program in Mechanical Engineering reflect the mission of University of Kyrenia. The Bachelor of Science program in mechanical Engineering prepares the students to achieve the following career and professional objectives.

- To acquire a strong foundation in Mechanical Engineering area relevant to the current needs of industry to allow them to successfully compete for demanding and high quality jobs
- Analyze problems, propose algorithmic solutions, and implement them correctly and efficiently by applying their knowledge of mathematics, computing, systems and development tools.
- Propose engineering solutions using the information and communication technologies for the related problems of industry and government.
- To acquire clear communication abilities, ethical and social responsibilities for teamwork.
- Make positive contributions to their community and society by applying skills and abilities learned during their undergraduate program in mechanicalengineering
- Improve knowledge and skills through lifelong learning and graduate studies.

10. Course Descriptions

MCE100 Mechanical Engineering Orientation
Introduction to mechanical engineering.Demonstrations of Mechanical Engineering Department Laboratories.Technical trips to various industrial sites.

CHE105 General Chemistry
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.Thermochemistry.Energy and enthalpy.Electronic structure of atoms.Electrochemistry.Chemical bonding.

ENG101 English I
Develops reading, writing, speaking, and listening skills by encouraging students to use language forms that they learn through reading and listening. The students are exposed to extensive reading both in and outside the classroom. They are encouraged to read a variety of texts such as short stories, academic articles, research reports, reviews and journalistic texts as well as chapters from textbooks.

MTH101 Calculus I
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.

MEC101 Engineering Drawing I
Intrıduction to CAD. Principles of engineering drawing (1st and 3rd angle orthotropic projections), drawing methodology stages, linework and lettering, isometric and oblique projections, drawing layouts (working drawings and assembly drawings), machine drawing features, sections and sectional views, geometrical constructions and dimensioning principles.

PHY101 Physics I
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.

ENG102 English II
Develops students autonomy, evaluation, analysis and research skills and synthesizing ability. Students will learn the discourse patterns and structures to be used in different essay types. An academic essay and a project report are assigned.

MTH102 Calculus II
Plane and polar co-ordinates, area in polar co-ordinates, arc length 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.

MEC102 Engineering Drawing II
Working with CAD, screw threads and threaded fasteners, locking and retaining devices, keys and keyways, limits and fits, unilateral and bilateral limits, geometrical tolerancing and applications, gears, springs and spring calculations, weld types and symbols, dimensioning, bearings.

PHY102 Physics II
Electrical charges Coulomb's law. Electrical fields Gauss's law. 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.

CMP101 Introduction to Programming

An introduction to fundamental concepts. Algorithms and flowcharts as tools of program design process. Basic program structure.Input/output statetments. Control structures: Selection and repetition statements and arrays. Concept of modular programming: Procedures and Functions.

MTH112 Linear Algebra
To provide a student with methods for solving systems of linear equations .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

MTH201 Differential Equations
Ordinary and partial differential equations.Explicit solutions.First-order differential equations, separable, homogenous differential equations.Ordinary linear differential equations.Bernoulli differential equations.Cauchy-differential equations.High-order ordinary differential equations. Introduction to Laplace transforms. Introduction to series method for solving differential equations. Linear systems of differential equations

MEC203 Statics
Composition and resolution of forces, equilibrium of particles and rigid bodies, centroids and center of gravity. Analysis of trusses, frames and machines. Moments and products of inertia, method of virtual work.Friction.

MEC204 Dynamics
A study of motion particles and rigid bodies. Application of Newton's second law to planar motions of rigid bodies, energy and momentum principles. Free, forced and damped vibrations of particle. Central force motions.Inertia tensor.Euler's equation of motion.

MEC207 Thermodynamics I
Basic concepts and definitions of classical thermodynamics.Thermodynamic processes, work and heat interactions. First law for systems and for flow processes. Second law and entropy, irreversibility and availability.

EEE206 Electrical Machinery
Basic Electrical Elements and Circuit Fundamentals.Magnetic circuits.Ideal transformers. Three phase transformers. Application areas of transformers. DC motors and generators, AC machines and generators. Application areas of electrical machines.

MEC208 Thermodynamics II
Thermodynamic cycles.Thermodynamics of mixtures and solutions, chemical reactions. Thermodynamic and mechanics of compressible fluid flow. Thermodynamic of energy conversion systems, refrigeration and air conditioning.

MEC210 Strength of Materials I
Introduction. Internal force diagrams. Analysis of stress and strain.Hooke's law. Yield criteria and plasticity. Axial force.Pure shear.Torsion of circular bars and thin walled tubes.Moment of inertia of cross-sections.Simple bending.

ENG211 English Communication Skills
Being an inter-active course, students will be encouraged to listen actively, respond to presentations, and participate in discussions. The main goal is to enhance the students' competence and willingness to express themselves in an organized manner in academic and professional contexts, and to interact with others confidently. It is important that students learn to conduct independent research and think critically on issues raised in the course.

MEC202 Manufacturing Technology I
Plastic forming of metals, hot and cold working, annealing and recrystallization. Technology of deformation processes. Forging and pressing, extrusion and rolling.Pipe manufacturing.Sheet working.Basic machine tool elements, metal cutting, turning, drilling and boring machines, milling machines, and cutters; sharpers and planars, grinding machines.

MEC205 Material Science
Materials and properties.Atomic structure and interatomic bonding, crystal structure, crystal imperfections, solid solutions.Mechanical properties of materials, elastic and plastic deformation.Behaviour of materials under tension, compression and shear.Hardness and hardness measurement.Dislocation and strengthening mechanism. Phase equilibria, phase diagrams, the iron –carbon system, solid reactions, microstructures. Structure and properties of ceramics.Polymer structure.

MCE200 Industrial Training I
This is a period comprising a minimum of 30 days training to be completed in an industrial organization by all students who are effectively in their junior or senior year. Students should obtain approval of the Department before commencing training. Following this training, students will be required to write a formal report and give a short presentation before a committee regarding their training.

EEE207 Introduction to Electronics
This course is designed for provide an understanding of the fundamentals and analysis of electric circuits. The course encompasses the fundamental concepts of electric circuits, such as Ohm's and Kirchhoff's laws. It develops into the circuit analysis techniques such as nodal and mesh analyses and the equivalent circuits. Energy storage elements and first order transient circuits are included in the course. The course also covers the analysis of sinusoidal circuits, including the power calculation.

MTH301 Numerical Analysis for Engineers
Approximations and errors.Accuracy and precision. Finite divided 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.

MEC355 Fluid Mechanics
Introduction, Fundamental concepts, Fluid statics, Basic equations in integral Form for a control volume, Introduction to differential analysis of fluid motion, Incompressible inviscid flow, Dimensional analysis and similitude, Internal incompressible viscous flow.

MCE302 Theory of Machines I
Introduction to mechanisms: basic concepts, mobility, basic types of mechanisms. Position, velocity and acceleration analysis of linkages.Cam mechanisms.Gear trains.Static and dynamic force analysis of mechanisms.

MEC303 Machine Component Design I
Introduction to mechanical engineering design. Load analysis, materials, deflection and stability. Stress analysis, stress concentrations. Strength of machine elements, theories of failure under static and dynamic loadings. Threaded fasteners, bearings riveted welded joints, springs. Lubrication and sliding bearings, rolling element bearings.Kinematics of spur gears.Design of spur gears.

MEC304 Machine Component II
Analysis and design of machine elements. Helical, bevel and worm gears. Shafts and associated parts, keys, pins, splines, couplings, clutches,brakers and fly wheels, belts, chains, torque converters. Design project involving a mechanical component or device including all detail drawings, assembly drawings and cost analysis.

MCE307 Strength of Materials II
Stress and strain, Mohr's circle.Bending with shear.The shear center.The shear center of thin walled sections.Elastic curve for symmetrical cross-sections.Study of elastic curve by various methods.Effect of shear on the elastic curve.Axial force with bending.Materials not resistant to tension.Bending with torsion.Energy methods.Theorem of virtual work.Theorems of Betti and Castigliano.Minimum principles.Elastic stability. Euler cases. Buckling beyond the elastic limit, method of omega multiplier, approximate methods, Rayleigh ratio.

MCE308 Control Systems
Introduction to automatic control.Mathematical modelling of dynamic systems. Response analysis using Laplace transform method. Transfer functions and block systems. Feedback control systems. Typical actuators and transducers. Control law.

MCE311 Manufacturing Technology II
Basic manufacturing processes, nature and properties of materials, production of ferrous and nonferrous metals. Principles of metal casting, types of molding.Design of models and cores.Melting furnaces.Powder metallurgy.Welding, oxygen gas welding, torch cutting, electrical arc welding.

MEC301 Heat Transfer I
Principles of heat transfer and their applications.Heat conduction in stationary systems.Transient Heat Conduction. Heat transfer associated with laminar flow and turbulence flow of fluids in forced and natural convection.

MCE314 Heat Transfer II
Numerical methods in heat conduction.Condensation and boiling. Heat transfer by radiation. Heat exchangers.Mass transfer.

MCE300 Industrial Training II
This is a period comprising a minimum of 30 days training to be completed in an industrial organization by all students who are effectively in their junior or senior year. Students should obtain approval of the Department before commencing training. Following this training, students will be required to write a formal report and give a short presentation before a committee regarding their training.

MCE400 Graduation Project
The design process and morphology. Problem solving and decision making.Modelling and simulation.Use of computers in engineering design and CAD.Project engineering, planning and management. Design optimization. Economic decision making and cost evaluation. Aspects of quality.Failure analysis and reliability.Human and ecological factors in design.Case studies. A term project is assigned.

MCE401 Hydraulic Machinery
Introduction, Pipes. Turbopumps, Cavitation. Dimensional Analysis and Stimilitude for Turbomachinery, Use of Turbopumps in Piping Systems, Turbines, Pelton Wheels, Wind Turbines.

MAN402 Management for Engineers
Principles of management.Functions of managers.Organisation and environment.Marketing management.Production management. Personnel management.Managerial control.
Accounting and financial reports. Budgeting and overall control.

MCE403 Theory of Machines II
Review and Concepts from Vibrations.Response of Single-Degree-of-Freedom Systems to Initial Excitations.Response of Single-Degree-of-Freedom Systems to Harmonic and Periodic Excitation.Response of Single-Degree-of-Freedom Systems to Nonperiodic Excitations, Two-degree-of-Freedom Systems.Multi-Degree-of-Freedom Systems. Vibration Control, Critical Speed of Shaft, Rotor Balancing.

MCE405 Experimental Analysis of Mechanical Engineering Systems
The need for experiments.Experimental procedure.Generalized measurement system.Report writing.Error treatment.Uncertainty.Frequency Distribution.Expected value, standard deviation.Presentation of experimental results.Plotting data. Curve fitting, linear regression. Non-linear relationships.Dimensional analysis.Laboratory experiments.

MCE411 Heating, Ventilating, Air Conditioning and Cooling Systems
Fundamentals of local and central heating, heating elements, heat loss calculations, heating by hot water, pipe layout design. Local and central cooling, cooling elements, heat gain calculations, cooling by chilled water.Air conditioning, ventilation, heating and cooling by air, duct design.Design of central heating and cooling systems.

MCE 412 Mechanical Metallurgy
Elastic properties of metals.Elements of theory of plasticity, yielding criteria for ductile materials.Plastic deformation of single crystals, dislocation theory, strengthening mechanisms.Fracture, fracture mechanics. Fatigue, high temperature deformation, creep and stress rupture. Plastic forming of metals, forging, rolling, extrusion and drawing.

MCE 415 Wind Engineering
Introduction and theory of wind energy and Betz limit, geographic and topographic distribution of wind velocity, area of application, types of wind turbines, research criteria of wind velocity distribution, wind data analysis, Helman coefficient, propellant profile data and usage, aerodynamics and characteristics of wind turbine propellers, design and control of wind turbines, efficiency of horizontal axis wind turbines, wind power, wind energy storage, general information on vertical axis turbines. Production of electricity.Economical considerations.

MCE 416 Solar Engineering
Sun, solar constant, radiation, spectral distribution and variation of extraterrestrial radiation, radiational properties of surfaces, solar angles, reckoning of time, radiation on horizontal and tiled surfaces, isolation on tiled surfaces, atmospheric attenuation of solar radiation, absorption of solar radiation, pyranometer, solar cells, solar plates, solar radiation data, estimation of solar radiation and clear sky radiation, beam and diffuse components pf radiation, energy storage.

MCE 418 Refrigeration Techniques
Application areas.Fundamentals of reversed heat engine cycles.Vapor-compression and absorption refrigeration cycles.Refrigerants.Absorption systems.Capacity control of refrigeration components.Cooling load calculations. System components: compressors, evaporators, condensers, expansion devices, piping, auxiliary and control devices. Cold storage rooms.Transportation of cooled materials.

MCE 421 Internal Combustion Engines
Fundamentals of spark-ignition and compression ignition engines.Actual engine cycles.Combustion and detonation.Air capacity and super-charging.Carburetion and fuel injection.Engine friction.Heat rejection and cooling.Performance characteristics and testing.

MCE 423 Heat Exchanger Design
Parallel, cross and counter flow type heat exchanger design calculations. Evaporation. Evaporator and condenser types: tube and shell, mixing types, and compact heat exchanges. Thermal stress problems of heat exchanges.Optimization of heat exchanges.Construction problems.

MCE 425 Machine Tools and Tool Design
Mechanics of metal cutting. Metal cutting tools. Cutting fluids.Machine tool selection.Cutting speed, feed and depth of cutting. Turning, drilling, shaping, planning, milling and broaching. Abrasives, grinding wheels and grinding operations, Finishing operations.

MCE 426 Introduction to Finite Element Method
Analysis of stress and strain.Constitutive equations.Plane problems of elasticity.The finite element concept.One-and two-dimensional finite element formulation

techniques.Transformations, assembly and solution techniques.Introduction to three dimensional finite elements.Project assignments of one and two dimensional problems.

MCE429 Computer Aided Design (CAD)
Introduction and priciples of CAD, Stages in CAE, Hardware Components, Fundamentals of CAD, Design Process, Application of Computers for Design, Geometrical Transformations, (3D transformation, scaling, rotation), Representation of 3D objects, 3D Solid Modeling, (Boolean operations), Representation schemes. Parametric Design, brief description of FEA(finite element analysis), Merits and Limits of CAD.

EAS431 Economics for Engineers
Principles and economic analysis of engineering decision making. Cost concept. Economic environment. Price and demand relations. Competition. Make-versus-purchase studies. Principles and applications of money-time relations. Depreciation. Many and banking. Price changes and inflation. Business and company finance.

MCE431 Energy Conversion Systems
Energy demand and available resources in the world. Renewable sources: wind, wave, tide, geothermal, biogas and solar energy. Fossil fuels, combustion and combustion equipment. Steam generators. Atomic structure, nuclear reactions; decay, fusion and fission. Reactors. Environmental effects.

MCE433 Mass Transfer
Fundamentals of mass transfer, principles of diffusion and diffusivity, molecular and convective mass transfer, phaseequlibria, equilibrium processes, absorbtion, membrane separation processes, leaching, distillation, drying andcrystallization, extraction, evaporation.

MCE441 Fluid Mechanics II
Flow Measurements. External incompressible viscous flow. Boundary layer theory. Potential flow theory. Turbomachinery, Introduction to compressible flow.

MCE442 Gas Dynamics
Introduction to Compressible flow. Flow Regimes, Integral Forms of the Conservation quation for Inviscid Flows. One-Dimensional Compressible Flow. The Speed of Sound and Mach Number. Categories of Wave Propagation in a Compressible Flow. Normal Shock Waves. One-Dimensional Flow with Heat Addition. One-Dimensional Flow with Friction. Oblique shock and expansion waves. Quasi-One-Dimensional Flow. Area-Velocity Relation. Nozzles. Diffusors.

MCE453 Materials Engineering
Engineering materials and properties. Materials selection and development. Thermal processing, specific examples. Some advanced materials. Design with brittle materials. Materials selection charts.

MCE454 Heat Treatment
Phase transformations in solids. Modification of material properties via the Processing – Structure – Property route. Types of heat treatment. Heat treatment of steels. Tool steels. Heat

trearment of cast irons. Heat treatment of non-ferrous metals. Heat treatment of non-metalic materials. Materials damage at elevated temperatures.

MCE461 Hoisting and Conveying Machines
Introduction to Material Handling, forms of transportable materials, basic elements of Hoisting, Block and Tackle Mechanisms, Lifting Mechanisms, Hoist types, Overhead travelling Cranes, Gantry Cranes, Column Jib Cranes, FEM standards, Conveyors (roller, gravity, screw and belt conveyors), conveyor components, Drive power calculations.

MCE472 Quality Control
The purpose of the course is to make an introduction and lay the foundation of modern methods of statistical quality control and improvements that are used in the manufacturing and service industries along with basic concepts of reliability. The students will first be introduced to some of the philosophies of quality control experts and their impact on quality. This course familiarizes students with quality control techniques, quality assuarance issues and quality management methods. Finally basic concepts of reliability of systems will be introduced.

MCE481 Biofuels
This is an elective course designed to acquaint the studentwith the current state of science and technology for the generation of energy from biologicallyderived sources. Topics covered include; sources of biomass feedstock, transesterification andbiodiesel fuel, fermentation and ethanol fuel, anaerobic digestion and biogas, thermal chemicalenergy transformation processes, and advanced biofuels, legislation on biofuels.

11. INFORMATION ON THE NATIONAL HIGHER EDUCATION SYSTEM

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".

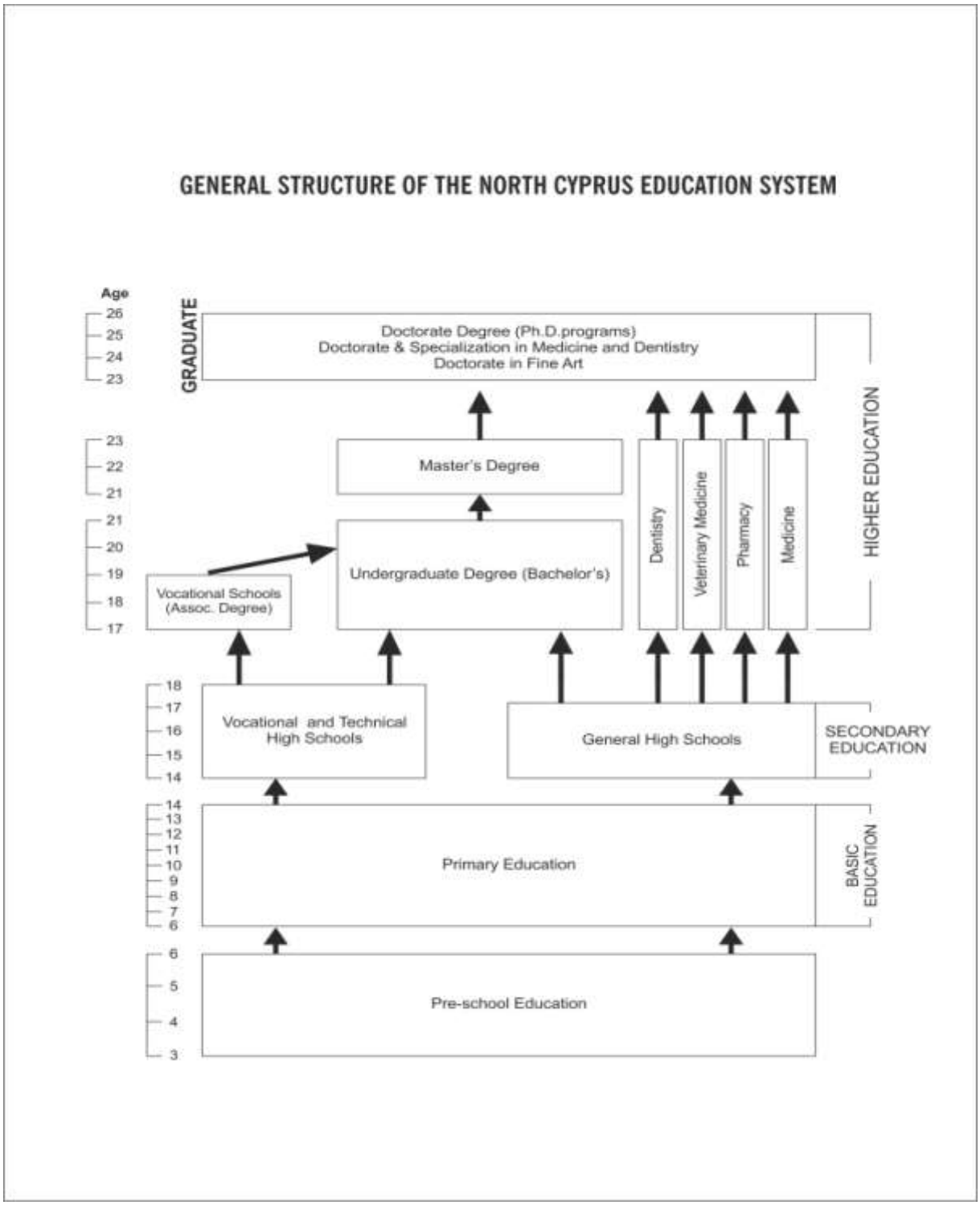
The Higher Education System in North Cyprus is regulated by the Higher Education Planning, Evaluation, Accreditation and Coordination Council (Yükseköğretim Planlama, Denetleme, Akreditasyon ve Koordinasyon Kurulu-YÖDAK). Established in 1988, the Council regulates the activities of higher education institutions 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) - (önlisansderecesi) and first cycle (bachelor degree) - (lisansderecesi) 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) – (yükseklisansderecesi) and third cycle (doctorate) – (doktoraderecesi) 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.



APPENDIX

FACULTY OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

1st Semester								2nd Semester							
Fall Semester								Spring Semester							
CODE	COURSE NAME	T	P	L	Credit	ECTS	Prerequisite	CODE	COURSE NAME	T	P	L	Credit	ECTS	Prerequisite
MATH 101	Calculus I	4	0	0	4	6		MATH 102	Calculus II	4	0	0	4	6	MATH 101
MEC 100	Mechanical Engineering Orientation	2	0	0	0	3		CMPE 101	Introduction to Programming	2	2	0	3	5	
MEC 104	Technical Drawing I	2	0	2	3	5		MEC 102	Technical Drawing II	2	0	2	3	4	MEC 104
ENG 101	English I	3	0	0	3	4		ENG 102	English II	3	0	0	3	4	ENG 101
PHYS 101	Physics I	3	0	2	4	6		PHYS 102	Physics II	3	0	2	4	6	PHY 101
CHE 105	General Chemistry	3	0	2	4	6		MATH 112	Linear Algebra	3	0	0	3	5	MATH 101
	Total				30	30			Total				29	30	
3th Semester								4th Semester							
Fall Semester								Spring Semester							
CODE	COURSE NAME	T	P	L	Credit	ECTS	Prerequisite	CODE	COURSE NAME	T	P	L	Credit	ECTS	Prerequisite
MATH 201	Differential Equations	4	0	0	4	6	MATH 102	HS1	Non-Technical Elective	3	0	0	3	6	
MEC 205	Material Science	3	0	0	3	5	CHE 105	MEC 202	Manufacturing Technology I	3	0	0	3	5	MEC 205
MEC 203	Statics	3	0	0	3	5	PHY 104	MEC 204	Dynamics	3	0	0	3	5	MEC 203
MEC 207	Thermodynamics I	3	0	0	3	5	PHYS 101	MEC 208	Thermodynamics II	3	0	0	3	5	MEC 207
ENG 211	English Communication Skills	3	0	0	3	4	ENG 102	MEC 210	Strength of Materials I	4	0	0	4	6	MEC 205
EEE 207	Introduction to Electronics	3	0	0	3	5	PHY 102	MEC 200	Industrial Training I (6 weeks)				2	3	
	Total				29	30			Total				30	30	
5th Semester								6th Semester							
Fall Semester								Spring Semester							
CODE	COURSE NAME	T	P	L	Credit	ECTS	Prerequisite	CODE	COURSE NAME	T	P	L	Credit	ECTS	Prerequisite
MATH 301	Numerical Analysis for Engineers	3	0	0	3	5	MATH 201	HS2	Non-Technical Elective	3	0	0	3	6	
MEC 305	Machine Component Design I	4	0	0	4	5	MEC 203/MATH 201	MEC 302	Theory of Machines I	4	0	0	4	6	MEC 204
MEC 307	Strength of Materials II	4	0	0	4	5	MEC 210	MEC 304	Machine Component Design II	4	0	0	4	5	MEC 305
MEC 311	Manufacturing Technology II	3	0	0	3	5	MEC 205	MEC 300	Control Systems	3	0	0	3	5	MATH 201
MEC 301	Heat Transfer I	4	0	0	4	5	MATH 201/PHYS 104	MEC 314	Heat Transfer II	4	0	0	4	5	MEC 301
MEC 305	Fluid Mechanics	3	0	2	4	5	MATH 201	MEC 300	Industrial Training II (6 weeks)				2	3	
	Total				22	30			Total				28	30	
7st Semester								8th Semester							
Fall Semester								Spring Semester							
CODE	COURSE NAME	T	P	L	Credit	ECTS	Prerequisite	CODE	COURSE NAME	T	P	L	Credit	ECTS	Prerequisite
MEC 405	Theory of Machines II	4	0	0	4	5	MEC 204	MEC 400	Graduation Project	4	0	0	4	6	
MEC [MECS 401]	Experimental Analysis of Mech. Eng. Systems	3	0	0	3	6		TE4	Technical Elective	3	0	0	3	5	
TE1	Technical Elective	3	0	0	3	5		TE5	Technical Elective [Structural Design]	3	0	0	3	5	
TE2	Technical Elective	3	0	0	3	5		TE6	Technical Elective [Special Project]	3	0	0	3	5	
TE3	Technical Elective	3	0	0	3	5		HS4	Non-Technical Elective	3	0	0	3	5	
ATA 101	Ataturk's Principles and History of Turkish Revolution I	2	0	0	2	2		TURK 102	Turkish II: Oral Expression	2	0	0	2	2	TURK 101
TURK 101	Turkish I: Written Expression	2	0	0	2	2		ATA 102	Ataturk's Principles and History of Turkish Revolution II	2	0	0	2	2	ATA 101
*TURK 1	Turkish I for foreign students							*TURK 2	Turkish II for foreign students						
	Total				28	30			Total				28	30	
*	Turkish I for foreign students	4	0	0	4	4		*	Turkish II for foreign students	4	0	0	4	4	

TE [ECTS]	30
ME [ECTS]	22
EC [ECTS]	60
CC [ECTS]	90
Total [ECTS]	240
Total [Credit]	157