NEAR EAST UNIVERSITY

DEPARTMENT OF MECHANICAL ENGINEERING

Course Catalogue

CONTENTS

This course catalogue is developed to give information about the Meachanical Engineering programme to all who are interested in the Near East University, Department of Mechanical Engineering eg. future students, parents, academics, universities and institutions, bodies abroad.

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 Mechanical Engineering and the course programme.

Sincerely

Prof. Dr. Yusuf ŞAHIN

Chairperson

Mechanical Engineering (ME) Programme

1. General Information about the Department of Mechanical Engineering

Near East University, Department of Mechanical Engineering was founded by Prof. Dr. Kaşif Onaran, in 1996. Students reached to 200 until 2004 and now it has increased over 400. The Department of Mechanical Engineering operates under the administration of the Faculty of Engineering.

The aims of the Mechanical Engineering Department are; bringing up experienced and knowledgeable individuals equipped with theoretical and practical information related to the discipline, and at the same time, bring up competent individuals who are able to contribute to the developments and research studies in the field, and be managers and instructors to continue to bring up qualified people who can effectively serve in this field.

By providing high quality educational opportunities, the vision of the Department of Mechanical Engineering is to be the most prestigious department of engineering so far is existing within the geography. It is positioned in by bringing up individuals having the ability to adapt to the changes upcoming throughout the world, achieving international success and thus becoming leading engineers.

To perform research studies and to educate engineers equipped with technical “know-how”, creative thinking and being able to try and research new technologies to achieve required goal is our mission and vission.The vision of the department is to have respect and authority in engineering activities and to gain acceptance through research projects, support to the nation and delivering high quality engineers.

Mechanical Engineering Department currently offers the following programs:

- BS Degree in Mechanical Engineering
- MS Degree in Mechanical Engineering
- PhD. Degree in Mechanical Engineering

The department has two sections: English and Turkish, thus, the language of instruction is English and Turkish.

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 NEU, if they are suitable to substitute studies in the NEU degree program. The Department of Mechanical Engineering also has foreign teachers and researchers, which makes it possible to widen both the educational and cultural perspective.

Website of the higher education institute - http://www.neu.edu.tr

2. **Official length of programme**:

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

3. 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 240ECTS credits. The curriculum is classified into curricular categories represented in Table 1. 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 science and mechanical engineering obligatory courses, studies of mechanical engineering electives courses, bachelor's thesis and practical training.

Table 1: Curricular categories of the program

Category	Notation	Credit	Weight, %
Mathematics	MT	18	13.1
Basic Science	BS	12	8.8
English Composition & Social Science	ECS	18	13.1
Mechanical Science	MS	22	10.4
Obligatory Mechanical Engineering Courses	OME	54	39.5
Elective Mechanical Engineering Courses	EME	18	13.1
Bachelor's Thesis	BT	4	2.9
Summer Internship	SI	-	-
	Total	148	100

Each module of the program (Appendix E) is classified into curricular categories. Each module is assigned a number of semester credit hours, according to the number and types of formal activities within a given week. These are determined as follows:

- Lecture hours: presentation of material in a classroom setting
  - 3 credit hour = 3 "hour" of lecture per week
  - 2 credit hour = 2 "hour" of lecture per week
- Laboratory hours: formal experimentation in a laboratory setting
  - 1 credit hour = 2 "hour" laboratory session per week
- Recitation hours: problem-solving sessions, etc. in support of lecture material
  - 1 credit hour = 2 "hour" of recitation per week

The professional competence acquired in the required subject studies is further developed by elective subject choices. In the Bachelor's Degree Program the portion of elective studies is 13,2%. In exceptional cases, the elective subject can be chosen from other degree programs, if it is suitable for the degree. The application has to be approved by the Head of Mechanical Engineering Department. With technical respect free electives on offer, students of the Bachelor's degree program may choose a certain specialization track to get a more distinguished qualifications profile.

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, machine tool's 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. Copies of the slides or book's chapter 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.

In addition to traditional teaching methods, a variety of other methods are used to support the teaching. Most computer based learning requires the use of computers as part of the learning process. Students use the departmental computer laboratories for their practical work in order to improve their practical skills. Students use computers in the laboratory under the supervision of either a teaching assistant or an instructor.

Educational methods used for the students can be classified into **teacher centered and student centered**. In **Teacher-Centered Approach**, the Teachers are the main authority figure. The primary role of the student is to passively receive information (via lectures and direct instruction) with an end goal of testing and assessment. It is the primary role of teachers to pass knowledge and information onto their students. In this model, teaching and assessment are viewed as two separate entities. Student learning is measured through objectively scored tests and assessments. In **Student-Centered Approach**, the teachers are an authority figure, teachers and students play an equally active role in the learning process. The teacher's primary role is to coach and facilitate student learning and overall comprehension of material. Student learning is measured through both formal and informal forms of assessment, including group projects, student portfolios, and class participation. Teaching and assessments are connected; student learning is continuously measured during teacher instruction. Commonly used teaching methods may include class participation, demonstration, recitation, memorization, or combinations of these.

4. Qualification Awarded

Mechanical Engineer (ME) (Bachelor's Degree/ first cycle in Bologna System)

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

5. **Access requirement(s)**

The admissions and entry requirements ensure that the students who are admitted to the degree program possess the required competences. Bachelor's degree modules are fully taught in English, and thus, good English skills are required.

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 Near East University entrance examination and obtain a pass mark from this examination. Successful students are admitted to the university, but not necessarily to the Mechanical Engineering Department.

Students from Turkey must select the Near East University and the Mechanical Engineering Department 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 Mechanical Engineering Department.

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 year. Successful students are admitted to the department at the end of their studies at the English preparatory school.

6. **Qualification Requirements**

148 Near East University Credits (Near East University Credit is contact hour based) which is total240 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.

ECTS also helps with the planning, delivery and evaluation of study programmes, and makes them more transparent (http://ec.europa.eu/education/ects/ects_en.htm) .

7. **Converting US College Credit Hours (semester credit hours-SCH) to ECTS**

ECTS is the most commonly used credit system in Europe. The major difference between the European Credit System ECTS and the US College Credit system is that the first is based on student workload and the second on contact hours. The ECTS is oriented towards the time required for a student to meet the intended study outcomes, while the U.S. system is more oriented towards the time a faculty member needs to teach.

Here is an example of conversion of credits from ECTS to Semester Credit Hours for a college or university in the U.S.: 1.67 ECTS = 1.00 US College Credit Hours

Conversion standards may vary between higher education institutions in the U.S.

(http://www.mastersportal.eu/articles/1110/what-you-need-to-know-about-academic-credit-systems-in-the-us.html)

A student is required to have minimum pass grade from each course and obtain minimum 2.00/4.00 cumulative Grade point Average (cumulative GPA) **.**

The students who have successfully completed the programme should be able to be science-based, skilled and competent **Mechanical Engineering specialist** prepared to meet the challenges of practicing mechanical engineering in the 21st century, and **researchers** who are prepared to conduct mechanical engineering research focused on bettering the human condition and advancing the fundamental understanding of mechanical engineering.

8. **Arrangements for transfer from another Mechanical Engineering department (Recognition of Prior Learning)**

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 OSS examination the candidate's entrance score must not be less than the lowest score for admission to the Near East 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.

For further details please contact:

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9. 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 7 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.

10. Grading Scheme and Grades

PERCENTAGE	COURSE GRADE	GRADE POINTS
90-100	AA	4.00 (Excellent)
85-89	BA	3,50-4,0 (Excellent)
80-84	BB	3,00-3,50(Very Good)
75-79	CB	2,50-3,0 (Very Good)
70-74	CC	2,00-2,50(Good)
65-69	DC	1,50-2,0 (Good)
60-64	DD	1,00-1,50 (Good)
50-59	FD	0,50-1,0(Failed)
0-49	FF	0,00 (Failed)

11. Occupational Profiles of Graduaotes

Graduates of the Department of Mechanical Engineering have an opportunity to be employed as production engineers, quality control engineers, design engineers and in companies giving engineering services and mechanical consultancy in addition toenergy engineers such as petroleum, gas, sunlight and wind and in a variety of private or public establishments.

The Department of Mechanical Engineeringhas good relations with the governmental and private organizations and companies in North Cyprus and Turkey, thereby ensuring up to date study program in regard to scientific expertise and regional industrial needs. Curriculum of the department is kept up to date by offering new core/ elective courses upon the regional requirements, the demand of employers, international organizations and job market representatives.

The graduates can find the job in the governmental and private organizations and companies where they can work as

- Manufacturing enginers
- Quality control enginers
- Maintenance specialists
- Design engineers
- Energy engineers
- Petrol and gas engineers
- Welding/foundary engineers

The modules in the degree structure are also closely linked to the research conducted in the department and provide a path to post graduate studies. Moreover, a large majority of Bachelor's projects are completed in cooperation with industry in various projects either at the university or in companies, and thus provide a link to the professional field and a path to future employment in specialist tasks in these research areas.

Practical relevance of the program is achieved by:

- lectures given by professionals from various fields;
- laboratory lessons;
- renewing course contents periodically based on the job market needs;
- implementing new courses based on the job market needs;
- guest lecturers delivered by engineering practitioners;
- providing project based learning in courses with term projects;
- providing graduation projects that involve practical applications both in manufacturing and service sectors;
- organizing international and domestic academic seminars and workshops;
- a summer practice (internship) in order to integrate knowledge and theory to practice in the fields of Mechanical Engineering.

A summer practice is included in the Bachelor's degree. A summer practice is lasted 40 working days.

12. Programme Director

Prof. Dr. Yusuf ŞAHİN (Chairperson)
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13. Key Learning Outcomes

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 mechanical requirements appropriate to its solution.
3. Ability to apply mathematical foundations, principles, and mechanical engineering techniques in the modelling and design of materials/processing.
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

14. Courses List with Near East University credits and ECTS

List of courses of taken each year are given below.

BSc in Mechanical Engineering

FRESHMAN

First Year, Fall Semester (22/22 credits, 30/30 ECTS)					
Course Code	Course Name	(Hour) Credit	ECTS	Category	Prerequisite
AIT101/	Atatürk's Principles Reforms	(2,0) 2	3	ECS	
YİT101	Turkish for Foreigners*				
ME100	ME Orientation	(2,0) 2	2	OME	
ECC103	Engineering Drawing I	(4,2) 3	5	OME	
CHM101	General Chemistry	(4,2) 4	5	BS	
ENG101	English I	(4,0) 3	3	ECS	
MTH101	Calculus I	(4,2) 4	6	MT	
PHY101	General Physics I	(4,2) 4	6	BS	

First Year, Spring Semester (20/40 credits, 30/60 ECTS)					
Course Code	Course Name	(Hour) Credit	ECTS	Category	Prerequisite
ECC101	Introduction to Computers& Programming	(4,2) 3	6	ECS	
ENG102	English II	(4,0) 3	3	ECS	ENG101
ECC013	Engineering Drawing II	(4,2) 4	6	MT	ECC103
MTH102	Mathematics II	(4,0) 3	4	MT	MTH101
PHY102	General Physics II	(4,2) 4	6	BS	PHY101
FNTE	Free Non-Technical Elective	(3,2) 3	5	BS	

SOPHOMORE

Second Year, Fall Semester (19/58 credits, 30/90 ECTS)					
Course Code	Course Name	(Hour) Credit	ECTS	Category	Prerequisite
MTH201	Ordinary Differential Equations	(4,2) 4	6	MT	MTH102
ECC211	Engineering Materials	(4,2) 4	7	OME	
ECC206	Statics	(4,0) 4	7	OME	PHY101
ECC207	Thermodynamics I	(4,0) 4	7	ECS	
ENG210	English III	(4,0) 3	3	ECS	ENG102

Second Year, Spring Semester (19/76 credits, 30/120 ECTS)					
Course Code	Course Name	(Hour) Credit	ECTS	Category	Prerequisite
EE206	Electrical Machinery	(3,2) 3	4	ES	PHY102
ME218	Applied Mathematics for Mech.Eng.	(3,2) 3	6	OME	MTH101
ECC209	Manufacturing Technology I	(4,0) 3	4	OME	
ECC208	Dynamics	(3,2) 3	5	OME	PHY101
ECC208	Thermodynamics	(4,0) 3	5	ECS	ECC207
ECC213	Strength of Materials I	(4,0) 4	5	ECS	ECC206
ME200	Workshop Training	-	1	SI	ECC209

JUNIOR

Third Year, Fall Semester (19/93 credits, 30/150 ECTS)					
Course Code	Course Name	(Hour) Credit	ECTS	Category	Prerequisite
ECC304	Fluid Mechanics I	(4,2) 4	7	OME	ECC212
ECC307	Machine Design I	(4,2) 4	6	OME	EE207
ME307	Strength of Materials II	(4,0) 4	6	MT	ECC213
ECC305	Manufacturing Technology II	(4,0) 3	4	OME	ECC209
ECC306	Heat Transfer I	(4,0) 4	7	OME	

Third Year, Spring Semester (17/109 credits, 30/180 ECTS)					
Course	Course Name	(Hour)	ECTS	Category	Prerequisite

Code		Credit			
MTH323	Numerical Analysis	(3,0) 3	6	OME	MTH102
ECC309	Theory of Machines I	(4,2) 4	5	OME	ECC212
ECC308	Machine Design II	(4,0) 4	5	OME	ECC307
ECC310	Control Systems	(3,0) 3	5	CS	MTH201
ME314	Heat Transfer II	(4,0) 3	6	OME	ECC306
ME300	Industrial Training	-	3	SI	ME200/ECC305

SENIOR

Fourth Year, Fall Semester (13/123 credits, 30/210 ECTS)					
Course Code	Course Name	(Hour) Credit	ECTS	Category	Prerequisite
ME403	Theory of Machines II	(4,2) 4	6	BT	ECC212/MTH201
ECC424	Exper.Analysis of Mech.Eng. System	(3,0) 3	6	OME	
TE	Technical Elective	(3,0) 3	6	EME	
TE	Technical Elective	(3,0) 3	6	EME	
TE	Technical Elective	(3,0) 0	6	EME	

Fourth Year, Spring Semester (16/148 credits, 30/240 ECTS)					
Course Code	Course Name	(Hour) Credit	ECTS	Category	Prerequisite
ME400	Graduation Project	(4,2) 4	7	BT	
TE	Technical Elective	(3,0) 3	6	EMS	
FE	Technical Elective	(3,0) 3	6	EMS	
TE	Technical Elective	(3,0) 3	6	EME	
RNTE	Restricted Non-Technical Elective	(3,0) 3	5	EME	

* AIT101 is a module for Turkish students.

In first semester AIT101 Atatürk's Principles Reforms course is designated for the students of Turkish nationality, the course TUR100 Turkish for Foreigners – for oversee students (foreigners).
MT: Mathematics, BS: Basic Science, ECS: English Composition and Social Sciences, MS: Mechanical Science, OME: Obligatory Mechanical Engineering Courses, EME: Elective Mechanical Engineering Courses, BT: Bachelor's Thesis, SI: Summer Internship.

RESTRICTED NON- TECHNICAL ELECTIVE

- ECC 426 Economics for Engineers 3 Credits 6 ECTS

- ECC 427 Management for Engineers 3 Credits 6 ECTS

TECHNICAL ELECTIVES (CATEGORY I)

Code	Title	Credits	ECTS
ME 401	Hydraulic Machinery	3	6
ME 411	Heating, Ventilating, Air Conditioning&Cooling System	3	6
ME 415	Wind Engineering	3	6
ME 416	Solar Energy	3	6
ME 418	Refrigation Tehniques	3	6
ECC 425	Internal Combustion Engines	3	6
ME 423	Heat Exchanger Design	3	6
ME 425	Machine Tools&Tool Design Programming	3	6
ME 426	Introduction to Finite Elements		
ME 429	Computer Aided Design	3	6
ME 431	Energy Conversion Systems	3	6
ME 433	Mass Transfer	3	6
ME 441	Fluids Mechanics II	3	6
ME 442	Gas Dynamics	3	6
ME 453	Materials Engineering	3	6
ECC 433	Heat Treatment	3	6
ME 461	Hoisting and Conveying Machines	3	6
ECC 434	Quality Control	3	6
ME 481	Biofuels	3	6

TECHNİCAL ELECTIVES (CATEGORY 2)

Category 2 technical electives are the courses offered by other departments. These courses have been carefully selected and pre-approved by the Department.

Code	Name	Credits	ECTS
ECC 426	Economics for Engineers	3	6
ECC 427	Management for Engineers	3	6

15. **Objectives and contents of the course:**

The educational objectives of the Degree Program in Mechanical Engineering reflect the mission of Near East University. 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, mechanical systems and development tools.
- Propose engineering solutions using the information/tools and advanced 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 mechanical engineering
- Improve knowledge and skills through lifelong learning and graduate studies.

The individual courses are described below. These courses are offered by the Mechanical Engineering Department together with the objective of each module.

FIRST YEAR

ME 100 - Mechanical Engineering Orientation 2 credits
Objective of the Course:
Introduce the university and campus, Introduction to mechanical engineering. Demonstrations of Mechanical Engineering Department Laboratories and workshops. Introduction Department Lecturers, Courses, and credit systems, Summer training principles, report writing, Technical trips to various industrial sites.
Course description
Introduction to mechanical engineering.Demonstrations of Mechanical Engineering Department Laboratories.Technical trips to various industrial sites.***Prerequisite: -***

CHM 101 - General Chemistry 3 credits
Objectives of the Course:
Develop fundamental principles of theoretical and applied chemistry, Develop scientific inquiry, complexity, critical thinking, mathematical and quantitative reasoning. Explain phenomena observed in the natural world. Develop basic laboratory skills
Course description
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.***Prerequisite: -***

ENG 101 - English I 3 credits
Objectives of the Course:
To develop students' language skills and capacity to conduct writing task through the vocabulary, listening and speaking skills.To develop their level of knowledge, communicative capacity, and ability to analyze and reflect on the language. To give learners the language they need for real-life, hands-on task like explaining a process or analyzing risk and to put into practice the academic skills that they will need to use during their educations.

Course description:
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. ***Prerequisite: -***

MTH 101 - Mathematics I 4 credits
Objectives of the Course:
Learn more about your academic program, Learn about limits, derivatives. Study integrals, definite integrals. To introduce the basic properties of determinants and some of their applications
Course description
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.***Prerequisite: -***

ECC 103 - Engineering Drawing I 3 credits
Objectives of the Course:
To teach the Principles of Technical Drawing and to help students to develop 3D thinking process in drawing, to teach dimensioning principles and to develop analytical thinking process. and to develop questioning/discussion techniques. Students should be able to read and understand the engineering drawings.

Descriptionof the Course
Introduction 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. ***Prerequisite: -***

PHY 101 - General Physics I 4 credits
Objectives of the Course:
Be able to know the basic laws of mechanics.To apply those laws for 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.***Prerequisite: -***

ENG 102 - English II 3 credits
Objectives of the Course:
to develop the students' capacity to conduct writing task through the vocabulary, listening and speaking skills ; to reinforce and consolidate the language and skills that the students have learned from earlier courses ; to develop their level of knowledge, communicative capacity, and ability to analyze and reflect on the language; to develop students' language skills to prepare them for their future professional life
Course description

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. ***Prerequisite: ENG 101***

MTH 102 - Mathematics II 4 credits
Objectives of the Course:
Sequences and Infinite Series; The integral test, comparison test, geometric series, ratio test, alternating series. Power series, Taylor series.Parametric equations and Polar coordinates. Functions of several variables, limits, continuity, partial derivatives, chain rule, extreme of functions of several variables. Multiple integrals: Double integrals, Area, volume, double integral in polar coordinates, surface area, triple integrals, spherical and cylindrical coordinates.
Course description
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.***Prerequisite: MTH 101***

ECC 013 - Engineering Drawing II 3 credits
Objectives of the Course:
To teach the principles of CAD and to teach/develop drawing techniques using CAD and design thinking and visualisation process in CAD, to teach the students the use of tolerances (Limits and Fits) when generating assembly/sub-assembly drawing and the areas of use for geometric tolerances and for students to gain techniques and the understanding of Torque transfer components.
Course description
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. ***Prerequisite: ECC 103***

PHY 102 - General Physics II 4 credits
Objectives of the Course:
Be able to know the basic laws of electricity and magnetism. To apply those laws for solving problems. To be able to use his/her knowledge in the fields of other sciences and/or engineering. Understanding how physics approach and solve problems in electricity and magnetism.
Course description
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.***Prerequisite: -***

ECC 101 - Introduction to Computers and Programming 3 credits
Objectives of the Course:
To familiarize the students with computers and computing fundamentals.To be able to analyze and design a solution to a given problem. To enable the students to write structured programs using C programming Language.
Course description
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. ***Prerequisite: -***

SECOND YEAR

ME 200 - Workshop Training Non-credit
Objectives of the Course:
The minimum time for this practice in an organization is four weeks (20 working days). The main objective is to observe a company in an original setting and answer questions on the fundamental areas of Computer Engineering and Information Science. A written report summarizing the training experience is required.
Course description
This is to be completed in the Department's workshops by all ME students. Students will spend at least 80 hours in the workshops, and perform various hand and machine tool operations under staff supervision. At the end of the training students will be required to complete a report regarding their training.
Prerequisite: ECC 209

MTH 201 - Differential Equations 4 credits
Objectives of the Course:
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
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.***Prerequisite: MTH 102***

ECC 206 - Statics 4 credits
Objectives of the Course:
Students will be able to do some force analysis using the some static rules and laws.Students will be able to apply multidimensionalstatic failure criteria in the analysis and design of mechanical components. - Knowledge of various multidimensional static failure criteria for different materials.
Course description
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.***Prerequisite: PHY 101***

ECC 212 - Dynamics 3 credits
Objectives of the Course:
This course teaches students how to apply Newtonian physics to analyse relatively simple physical mechanisms. - with some emphasis on commonly encountered engineering applications.
Course description
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.***Prerequisite: PHY 101***

ECC 207 - Thermodynamics I 4 credits
Objectives of the Course:

Students develop an understanding of the theoretical framework of classical equilibrium thermodynamics and how it applies to energy conversion in technological applications. Students develop the capability to analyse the energy conversion performance in a variety of modern applications.

Course description

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.

Prerequisite: -

EE 206 - Electrical Machinery 3 credits

Objectives of the Course:

Conceptual overview of law and methods in engineering. Teaching Methods of Circuit theory. Teaching Power in circuits

Course Description

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. Three phase transformers. Application areas of transformers. DC motors and generators, AC machines and generators. Application areas of electrical machines.***Prerequisite: PHY 102***

ECC 208 - Thermodynamics II 3 credits

Objectives of the Course:

To be able to understand the working principles of the ideal Otto, Diesel and Brayton which are ideal gas cycles and to make the necessary efficiency calculations. Examination of cycles of steam and refrigeration machines and calculation of required efficiency

Course description

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.***Prerequisite: ECC 207***

ECC 213 - Strength of Materials I 4 credits

Objectives of the Course:

The objective of this course is to be elaborate on the knowledge of engineering mechanics (statics) and to teach the students the purpose of studying strength of materials with respect to mechanical engineering design and analysis.

Course description

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.***Prerequisite: ECC 206***

ENG 201 - English III 3 credits

Objectives of the Course:

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. to develop the skill of reading for information from a wide variety of authentic Engineering texts. To develop the ability to participate in exchanges of information and opinions in the context of IT and Engineering. To develop communication

skills for the job market which is becoming increasingly common to have give presentation in English.To write instructions, descriptions and explanations about topics in Engineering.

Course description

Being an inter-active course, students will be encouraged to listen actively, respond to presentations, and participate in discussions. These include longer specialist reading texts to provide challenging reading for students already proficient in this field, and gain the ability to read and understand vacancy announcements and write an appropriate cover letter/letter of intent, CV to deliver a academic presentation in English.

It is important that students learn to conduct independent research and think critically on issues raised in the course. ***Prerequisite: ENG 102***

ECC 214 - Manufacturing Technology I 3 credits

Objectives of the Course:

This course is to provide students with an understanding of themanufacturing technologies being used by different machines and tools in manufacturing industries in the area of metal cutting and processes.

Course description

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.***Prerequisite: -***

ECC 211 - Engineeing Materials 4 credits

Objectives of the Course:

Provide a conceptual framework for understanding the behavior of engineering materials by emphasizing important relationships between internal structure and properties and to present a general picture of the nature of materials and the mechanisms that act upon, modify, and control their properties.

Course description

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.***Prerequisite: -***

ME 218 – Applied Mathematics For Mechanical Engineers 3 credits

Objectives of the Course:

To provide necessary mathematical and programming background for analysing, processing and presenting experimental data gathered from the experiments conducted on mechanical engineering applications

Course description

Complex numbers, Matrix algebra, Methods of solution of linear equation systems.Vectors in 2D-Space and 3D-Space, Eigenvalues, Eigenvectors, Diagonalizations, Fourier Series. Applied Probability and Statistics.***Prerequisite: MTH101***

ECC - 214 Manufacturing Technology I 3 Credits

Objectives of the Course:

Students can explain how safety issues were addressed in a manufacturingprocess; identify the impacts of new technologies and/or techniques on the suitability of different types of manufacturing methods.

Description of the Course
Plastic forming of metals, hot and cold working, annealing and recrystallization. Technology of deformation processes. Forging and pressing, extrusion and rolling.Pipe manufacturing. Sheet metal working processes. Cutting, bending, deep cup drawing.Basic machine tool elements, metal cutting, turning, drilling and boring machines, milling machines, and cutters; shapers and planers, grinding machines. Engineering analyzing of the cutting Force and power.***Prerequisite: -***

THIRD YEAR

ME 300 - Industrial Training Non-credit
Objective of the Course:
The main objective is to observe a company in an original setting and answer questions on the fundamental areas of Mechanical Engineering and Mechanical Science. A written report summarizing the training experience is required.
Course description
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.

MTH 323 - Numerical Analysis 3 credits
Objectives of the Course:
The course will be develop an understanding of the elements of error analysis for numerical methods and certain proofs. It also derive appropriate numerical methods to solve algebraic and transcendental equations.
Course description
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.***Prerequisite: MTH 102***

ECC 304 - Fluid Mechanics 4 credits
Objectives of the Course:
The students gain an understanding on the fundamental concepts of Fluid Mechanics, and the methods to solve engineerings problems related to Fluid Mechanics.

Course description
Introduction and Basic Concepts, Properties of Fluids, Pressure and Fluid Statics, Fluid Kinematics, Mass, Bernoulli and Energy Equations, Momentum Analysis of Flow Systems, Dimensional Analysis and Modeling, Flow in Pipes, Differential Analysis of Fluid Flow, Approximate Solution of Navier-Stokes Equations, Flow over Bodies: Drag and Lift.**Pre-requisite: ECC212**

ECC 309 - Theory of Machines I 4 credits
Objectives of the Course:
The theory of machines and mechanisms are an applied science that is used to understand the relationships between the elements of the system. It is also developed an analysis ability on some maching components.
Course description

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.***Prerequisite: ECC 212***

ECC 307 - Machine Design I 4 credits
Objectives of the Course:
To teach students how to apply the concepts of stress analysis on some mechanisms such as gear, cams etc., theories of failure and material science to analyze, design and/or select commonly used machine components.
Course description
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.***Prerequisite: ECC 213***

ECC 308 - Machine Design II 4 credits
Objectives of the Course:
Students will be able any design, calculation and select an appropriate machine elements for assembly of the device or machine.
Course description
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. ***Prerequisite: ECC 307***

ME 307 - Strength of Materials II 4 credits
Objectives of the Course:
At the end of the Course, he will be able to do force/stress/strain/deflection analysis with different approaches.It can be bending,compression,torsion or combinations.
Course description
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. ***Prerequisite: ECC 213***

ECC 310 - Control Systems 3 credits
Objective of the control system:
A control system consisting of interconnected components is designed to achieve a desired purpose. It is useful to examine examples of control systems through the course of history.Regulation keep controlled variable near a constant target value (e.g. process control: pressure, concentration etc.). • Tracking keep controlled variable near a time-varying target value (e.g. antenna positioning, robotic manipulator point-to-.
Course description
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. ***Prerequisite: MTH 201***

ECC 305 - Manufacturing Technology II 3 credits
Objectives of the Course:

Students will be able understand the prenciples/problems for casting or welding processes and types of moulding. It will also see how to be formed the defects on the casted samples.
Description of the Course.

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.***Prerequisite: ECC 209***

ECC 306 - Heat Transfer I 4 credits
Objectives of the Course:
Provide a conceptual frame work for understanding the heat transfer through solid bodies; emphasize the importance of energy interactions at the solid-fluid boundary to temperature distribution in solids. Enhance the ability to apply the knowledge of mathematics and science to heat transfer related problems. Develop practical solutions for thermal related mechanical engineering problems under professional and ethical constraints.
Course Description
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. ***Prerequisite: ECC 207***

ME 314 - Heat Transfer II 3 credits
Objectives of the Course:
After completing this course, the student will be able to predict the flow type, calculate local and mean heat transfer coefficients at surfaces for external and internal flows and indentify the entrance length of a tube flow. The importance of thermal radiation in engineering systems is identified. Basic design methods of heat exchangers are introduced and practical solutions to heat exchanger design under professional and ethical constraints are demonstrated.
Course Description
Numerical methods in heat conduction.Condensation and boiling. Heat transfer by radiation. Heat exchangers.Mass transfer.***Prerequisite: ECC 306***

FOURTH YEAR

ME 400 - Graduation Project 4 credits
Objectives of the Course:
The purpose of the graduation project is to provide students with an opportunity to engage in an activity that will allow them to demonstrate their ability to apply the knowledge and skills they have gained throughout their years in the educational system
Course Description
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. ***Prerequisite: (4th year student)***

ME 403 - Theory of Machines II 4 credits
Objectives of the Course:
At the end of this course, the student will understand and appreciate the importance of vibrations in mechanical design of machine parts that operate in vibratory conditions, • be able to obtain linear vibratory models of dynamic systems with changing complexities (SDOF, MDOF), be able to write the report.

Course Description
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. ***Prerequisite: ECC 212 / MTH 201***

ECC 424 - Experimental Analysis of Mechanical Engineering Systems 4 credits
Objectives of the Course:
To teach students the type of engineering measuring instruments which are available in industry and their underlying operating principles.
To make sure that students gain hands on experience in using industrial and laboratory measuring instruments and to teach them how to set up experiments on mechanical systems and design. Students should be able to make a selection from measuring instruments depending on their accuracy limitations and the environment and be able to ask intelligent questions. To teach the students how to support the applications of basic mechanical engineering courses with experimental analysis.

Course Description

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.
Prerequisite: (4th year student)

ME 453 Materials Engineering 3 credits

Objectives of the Courses:
Develop an ability to apply the knowledge of structure↔property↔performance↔failure and processing↔structure↔property relations in engineering materials.Specific properties and applications of all classes of engineering materials.Design with brittle materials and Weibull analysis.Have a short view of materials selection approaches, materials selection charts and examples.
Description Course

Engineering Materials like metals, polymer, ceramics.Atomic and bondings,crystal inperfection. Some mechanical properties (Elastic and plastic deformation), Hardness, tensile strength, compressive strength, fatique resistance etc.), Dislocations, Phase diagrams, Iron-carbon system, Microstructure,and Heat treatment processes.

ME 454- Heat Treatment 3 credits

Objectives of the Course:
The necessary fundamentals for understanding the material properties given by the available heat treatment processes, standards and patents.
The ability to evaluate the microstructural transformations and corresponding modifications in material properties after various thermal, thermomechanical and thermochemical treatments.
The ability to select different manufacturing technologies and heat treatments in product, device and system planning.

Description the Course

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. Prerequisite: ECC 211

ECC 434 - Quality Control 3 credits
Objectives ofCourse:
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.
Description of the Course
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. ***Prerequisite: -***

ME481 – BIOFUELS 3credits

Objectives of the Course:
The course is aimed to make students aware that biological relatives can be used as an energy source , to give the students the technological routes for biofuels production, to classify and modify the existent engines for biofuels and to give a conceptual framework for understanding the environmental, social and economic impacts of biofuels.
Desciption of the Course
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. ***Prerequisite: -***

ME 482 - Introduction to Computational Fluid Dynamics 3 credits

Objectives of the Course:
To introduce the student to widely used techniques in thenumerical solution of fluid equations, issues that arise in the solution of such equations, and modern trends in CFD.
Description of the Course
Introduction to the finite volume method applied to fluid mechanics and heat transfer equations. Explanation of diffusion, convection, transient and source terms of the equations.Numerical approximations. Algebraic equations, computational cell structure. Discretization process, general rules, examples. Introduction to the Mentor Graphics FloEFD commercial CFD code.Application of FloEFD to various heat transfer and fluid mechanics engineering problems. Solution of heat conduction, forced convection, 2D/3D problems, natural convection flows, steady/transient heat transfer and similar engineering problems in the computer laboratory.

TECHNICAL ELECTIVE COURSES

ME 401 - Hydraulic Machinery 3 credits
Objectives of the Course:
To introduce theory of hydraulic machines. To teach design principles of turbines and pumps and to use them in engineering applications. Learning Outcomes and. Competences. Learning principles of hydraulic machines.
Course description
Introduction, Pipes. Turbopumps, Cavitation. Dimensional Analysis and Stimilitude for Turbomachinery, Use of Turbopumps in Piping Systems, Turbines, Pelton Wheels, Wind Turbines.***Prerequisite: ECC 304***

ME 411 - Heating, Ventilating, Air Conditioning and Cooling Systems 3 credits
Objectives of the Course:
To provide the necessary equipment for the design of heating, cooling, ventilation and air conditioning systems.

Course description
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.***Prerequisite: - (ECC 306 recomended)***

ME 415 - Wind Engineering 3 credits
Objectives of the Course:
To teach students about wind energy which is one of the renewable energy sources and to increase their knowledge regarding the necessary calculations.
Course Description
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.***Prerequisite: ECC 304***

ME 416 - Solar Engineering
Objectives of the Course:
To teach students about wind energy which is one of the renewable energy sources and to increase their knowledge regarding the necessary calculations. The objective of this course are to provide the student with the energy principles.Students will be able to discussing about solar energy operation. Students will be able to calculate the power from solar energy directly from sun or using by solar cells

Course Description
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. ***Prerequisite: ECC 306***

ME 418 - Refrigeration Techniques
Objectives of the Course:

Introduce aspects of various natural refrigeration methods, namely: Use of ice transported from colder regions. Use of ice harvested in winter and stored in ice houses. Use of evaporative cooling.

Course description

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.

Prerequisite: ECC 208

ME 431 - Energy Conversion 3credits

Objective of the Courses:

This course will provide students with hands-on learning experiences as they conceive, design and implement renewable energy systems.

Description of the Course

Energy needs and resources in the world, Renewable energy sources: Wind, Wave, Tide, Geothermal, Biogas and Solar Energy. Fossil fuels, Combustion and combustion equipment. Steam Generators. Atomic structure, Nuclear Reactions; Degradation, Fusion. Reactors. Environmental effects. **Pre-requisite: ECC207.**

ECC 425 - Internal Combustion Engines 3 credits

Objectives of the Course:

The main objective of the course is to give the students an introduction to reciprocatinginternal combustion engines with emphasis on marine and stationary applications. The focus is on explaining engine performance in terms of power, energy utilization and exhaust emissions, its relation to internal system.

Descriptionof the Course

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.***Prerequisite: ECC 208***

ME 423 - Heat Exchanger Design 3 credits

Objectives of the Course:

To be able to design and optimize heat exchangers by using heat transfer information.

Descriptionof the Course

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.***Prerequisite: ECC 306***

ME444 - Flow Measurements 3 credits

Objectives of the Course:

Students in this course have to prepare a tem paper applicable to a specific flow problem in mechanical engineering and present it in the class.

Description of the Course

In this course, the students are introduced to several mechanical engineering related flow and temperature measuring devices and their related properties. In addition to conventional pressure measuring devices, elastic transducers with high sensitivity are studied. In addition to Magnetic flow meters, properties of Orifis plates, Venturi meter and Rotameters are given, the calibration methods for flow measuring devices are explained.

ME441 - Fluid Mechanics II 3 credits

Objectives of the Course:
After the completion of this course, the student will be able to develop a thorough understanding on solving problems related to incompressible and compressible flow in Fluid Mechanics and in the other fields of fluid mechanics such as hydraulic machinery.

Description of the Course
Flow measurements, External incompressible viscous flow, Potential flow theory, fluid flow about Immersed bodies. Fluid machinery, Open channel flow, Introduction to compressible flow.**Pre-requisite: ECC304**

RESTRICTED NON-TECHNICAL COURSES

ECC 426 - Economics for Engineers 3 credits
Objectives of the Course:
Discuss principles and economic analysis of decision making. Discuss cost concepts, make-versus-purchase studies; Analyze principles of money-time relationships. Work on cash flow analysis. Analyze application of money-time relations. Analyze supply and demand relations. Analyze price and demand relations.Analyze breakeven point analysis and effects of inflation on money-time relationships
Descriptionof the Course
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.

ECC 427 - Management for Engineers 3 credits
Objectives of the Course:
Discuss principles of management, Discuss functions of managers, Discuss organization and environment, Discuss marketing, production and personnel management, Discuss marketing control, Discuss accounting and financial reports, Discuss budgeting and overall control,
Description of the Course
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.

16. Sample copy of diploma supplement

At the end of program the diploma supplement which is given to all graduates of our university free of charge. It ıs arranged in English.

The diploma supplement is a document the purpose of which is to provide sufficient independent data to improve the international “transparency” and fair academic and professional recognition of qualifications (diplomas, degrees, certificates, etc.). It is designed to provide a description of the nature, level, context, content and the status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended. It should be free from any value judgments, equivalence statements or suggestions about recognition

Diploma supplement

Diploma No:	**Diploma Date: 11.07.2014**
1.INFORMATION IDENTIFYING THE HOLDER OF THE QUALIFICATION	
1.1. ***Family name(s):*** **1.2.** ***Given name(s):***	**1.3.** ***Place and date of birth:*** **1.4.** ***Student identification number:***
2. INFORMATION IDENTIFYING THE QUALIFICATION	
2.1. ***Name of the qualification and (if applicable) the title conferred*** BACHELOR OF SCIENCE, B.Sc. **2.2.** ***Main field(s) of study for qualification*** MECHANICAL ENGINEERING **2.3.** ***Name and status of awarding institution*** NEAR EAST UNIVERSITY, PRIVATE UNIVERSITY	**2.4.** ***Name and type of institution administering studies*** SAME AS 2.3. **2.5.** ***Language(s) of instruction/examinations*** ENGLISH
3. INFORMATION ON THE LEVEL OF THE QUALIFICATION	
3.1. ***Level of qualification*** First Cycle (Bachelor's Degree)	**3.2.** ***Official length of program*** Normally 4 Years (excluding 1 year English Preparatory School, if necessary), 2 semesters per year, 16 weeks per semester
3.3. ***Access requirement(s)*** Admission of Turkish nationalities to higher education is based on a nation-wide Student Selection Examination (ÖSS) administered by the Higher Education Council of Turkey (YÖK). Admission of Turkish Republic of Northern Cyprus nationals is based on the Near East University Entrance and Placement Exam for Turkish Cypriots. Admission of foreign students is based on their high school credentials. Proof of English language proficiency is also required.	
4. INFORMATION ON THE CONTENTS AND RESULTS GAINED	
4.1. ***Mode of study*** Full-Time	**4.2.** ***Programme requirements*** A student is required to have a minimum CGPA of 2.OO/4.00 and no failing grades (below DD).
4.3. ***Objectives*** The aim of the computer 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.	***4.4. Programme details and the individual grades/marks obtained*** Please see the next page.

4.5. ***Grading scheme, grade translation and grade distribution guidance:***

For each course taken, the student is assigned one of the following grades by the course teacher.

For A.Sc., B.Sc. or B.A. degrees, students must obtain at least DD or S from each course and have a GGPA of not less than 2.00 out of 4.00 and have completed all the courses and summer practices in the program. For graduate degrees, students must obtain at least CC or S from each course for M.Sc. and M.A., at least BB for Ph.D. They also need to have a GCPA of 3.00 to graduate. The student's standing is calculated in the form of a Graduate Point Average (GPA) and Cumulative Grade Point (CGPA) and is announced at the end of each semester by the Registrar's Office. The total credit points for a course are obtained by multiplying the coefficient of the final grade by the credit hours. In order to obtain the GPA for any given semester, the total credit points are divided by the total credit hours. The averages are given up to two decimal points. Students who obtain a CGPA of 3.00-3.49 at the end of a semester are considered as "Honour Students" and those who obtain a CGPA of 3.50-4.00 at the end of a semester are considered as "High Honour Students" and this is recorded in their academic report. The letter grades, the quality point equivalents are:

Percentage	**Course Coefficient**	**Grade**	**Percentage**	**Course Coefficient**	**Grade**
90-100	4	AA	70-74	2	CC
85-89	3.5	BA	65-69	1.5	DC
80-84	3	BB	60-64	1	DD
75-79	2.5	CB	50-59	0.5	FD
49 and below	0	FF			

I- Incomplete **S**- Satisfactory Completion, **U**-Unsatisfactory, **NA**-Never Attended,**E**-Exempted, **W**– Withdrawn

4.6*Overall classification of the award*	CGPA: 3.04/4.00
5. INFORMATION ON THE FUNCTION OF THE QUALIFICATION	
5.1. ***Access to further study*** May apply to second cycle programmes.	**5.2.** ***Professional status conferred*** This degree enables the graduates to teach English in public and private institutions.
6. ADDITIONAL INFORMATION	
6. 1. ***Additional information*** The department is accredited by Edexcel Assured Services for its quality standards.	***6.2. Sources for further information*** ***Faculty web site***http://www.neu.edu.tr/en/node/6183 ***Department web site*** http://english.neu.edu.tr/ ***University web site*** http://www.neu.edu.tr ***The Council of Higher Education of Turkey*** http://www.yok.gov.tr ***Higher Education Planning, Evaluation Accreditation and***

	Coordination of North Cyprus Council Web site http://www.ncyodak.org **Edexcel Quality Assured Services** http://www.edexcel.com/international/qualifications/edexcel-assured/Pages/default.aspx

4.4. *Program details and the individual grade/marks obtained:*

1 (1st Semester)

Course Code	Course Name	CR	ECTS	Status	Grade
YİT101	Turkish for Foreners	2	3	Compulsory	
ME100	Mechanical Engineering Orientation	2	2	Compulsory	
ECC103	Engineering Drawing I	3	5	Compulsory	
ENG101	English I	3	3	Compulsory	
MTH101	Mathematics I	4	6	Compulsory	
PHY101	General Physics I	4	6	Compulsory	
CHEM101	General Chemistry	4	6	Compulsory	
		22	30		

2 (2nd Semester)

Course Code	Course Name	CR	ECTS	Status	Grade
ECC101	Introduction to Computers&Programming	3	6	Compulsory	
ECC013	Engineering Drawing II	3	4	Compulsory	
ENG102	English II	3	3	Compulsory	
MTH102	Mathematics II	4	6	Compulsory	
PHY102	General Physics II	4	6	Compulsory	
FNTE	Fre Non-Technical Elective	3	5	Compulsory	
		20	30		

3 (3rd Semester)

Course Code	Course Name	CR	ECTS	Status	Grade
MTH201	Ordinary Differential Equations	4	6	Compulsory	
ECC211	Engineering Materials	4	7	Compulsory	
ECC206	Statics	4	7	Compulsory	
ECC207	Thermodynamics I	4	7	Compulsory	
ENG201	English III	3	3	Compulsory	
		19	30		

4 (4th Semester)

Course Code	Course Name	CR	ECTS	Status	Grade
EE206	Electrical Machinery	3	4	Compulsory	
ME218	Applied Mathematics for Mech.Eng.	3	6	Compulsory	
ECC	Manufacturing Technology I	3	4	Compulsory	
ECC212	Dynamics	3	5	Compulsory	
ECC208	Thermodynamics II	3	5	Compulsory	
ECC213	Workshop Training	-	1	Compulsory	
		19	30		

5 (5th Semester)

Course Code	Course Name	CR	ECTS	Status	Grade
ECC304	Fluids Mechanics I	4	7	Compulsory	
ECC307	Machine Design I	4	6	Compulsory	
ME307	Strength of Materials II	4	6	Compulsory	
ECC305	Manufacturing Technology	3	4	Compulsory	
ECC306	Heat Transfer I	4	7	Compulsory	
		19	30		

6 (6th Semester)

Course Code	Course Name	CR	ECTS	Status	Grade
MTH323	Numerical Analysis	3	6	Compulsory	
ECC309	Theory of Machines I	4	5	Compulsory	
ECC308	Machine Design II	4	5	Compulsory	
ECC310	Control Systems	3	5	Compulsory	
ME314	Heat Transfer II	3	6	Compulsory	
ME300	Industrial Training	-	3	Compulsory	
		17	30		

7 (7th Semester)

Course Code	Course Name	CR	ECTS	Status	Grade
ME403	Theory of Machines II	4	6	Compulsory	
ECC424	Exper.Analysisi of Mech.Eng.Systems	3	6	Compulsory	
TE	Technical Elective	3	6	Technical Elective	
TE	Technical Elective	3	6	Technical Elective	
TE	Technical Elective	3	6	Technical Elective	
		16	30		

8 (8th Semester)

Course Code	Course Name	CR	ECTS	Status	Grade
ME400	Graduation Project	4	7	Compulsory	
TE	Technical Elective	3	6	Technical Elective	
TE	Technical Elective	3	6	Technical Elective	
TE	Technical Elective	3	6	Technical Elective	
RNTE	Restricted Non-Technical Elective	3	6	Non-Technical Elective	
		16	30		

TOTALCREDITS 148, TOTAL ECTS 240

7. CERTIFICATION OF THE SUPPLEMENT

7.1. *Date* :

7.2. Name and *Signature* :Ümit Serdaroğlu

7.3. *Capacity* : Registrar

7.4. *Official stamp or seal* :

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 at 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, Accreditationand 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) - (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.

GENERAL STRUCTURE OF THE NORTH CYPRUS EDUCATION SYSTEM