# NEAR EAST UNIVERSITY
# FACULTY OF ENGINEERING

## DEPARTMENT OF
## MECHATRONIC ENGINEERING

## COURSE CATALOGUE

# CONTENTS

This course catalogue is developed to give information about the mechatronic engineeringprogramme to all who are interested in the Near East University, Department of mechatronic 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 mechatronic engineering and the course programme.

Sincerely

Prof. Dr. Bülent Bilgehan

Chairperson

# MECHATRONIC ENGINEERING (MCT) Programme

1. **General Information about the Department of mechatronic engineering**

The Department of Mechatronic engineering was founded by Prof. Dr. Fahreddin Sadikoglu, in 1990. The department started off with 25 students. Since the year of foundation, Theory of Circuit, Electronic, Electrical Measurement, Intelligent Circuits, Computer Applications, Physics and Chemistry laboratories have been established one after another and provided the students and lecturers with a fully equipped training environment. Today, the department has reached 499 students. By incorporating high-voltage, electro-mechanics, energy recycling, power electronic, preserving power systems, programmable intelligent controller telecommunication, and communication through satellites, mobile communication, micro-processors, picture formation and intelligent systems laboratory, the department is proud to provide extensive training facilities for the benefit of students.

**Aims and Goals**

- We aim to provide the following to our students:
- By providing contemporary education opportunities, we aim to bring up creative individuals who will be active and have a say in all areas of electric and electronic engineering
- A solid mathematical and scientific background necessary to comprehend the fundamentals of engineering
- Providing engineering instructions which trigger competition within the market
- Redounding an effective qualification and knowledge on laboratories
- Assisting the students to acquire the ability to design
- Bringing in an ability to communicate effectively and to act with social, ethical, and professional responsibility in fulfilling their commitment inside and outside the professional engineering field.
- Bringing up individuals with the consciousness of life-long learning
- Bringing up individuals with the consciousness on the fact that engineering is subsidiary for social life, business world, industry and human beings.
- **Its Strengths**
- Having a dynamic and youthful academic staff
- The ability to have online access to journals and magazines published worldwide
- Having superiority over departments of the TRNC universities by comprising academic staff and a comprehensive laboratory system
- An increase in the number of publications
- Having the determination and effort in improving the quality and effectiveness of the laboratories
- Having a flexible management

- **Mission**

  The mission of the Department of Mechatronic engineering is providing the highest quality of

educational environment necessary for engineering under the guidance of an experienced academic staff and through its well-developed infrastructure. By this way, the mission of the department is reaching a successful level in competing in both the fields of engineering and implementing research.

- **Vision**

  By providing high quality educational opportunities, the vision of the Department of Mechatronic engineeringis 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.

- **Information on Education**

  Educational Programs (graduate, postgraduate studies)Undergraduate program of Mechatronic engineeringMaster of Science program of Mechatronic engineeringPhD program of Mechatronic Engineering.

  **Language of Instruction**

  Undergraduate Mechatronic engineering program has English language is in progress.

- **English Preparatory Program**

  Students registering to the undergraduate program in English language of the department are required to follow a one-year English preparatory program.

- **Further Information**

  There is an accredited IEEE student branch which has been performing since 1997.

- **Job Opportunities**

  Our graduates have been employed in related jobs in countries all over the world. Our graduates can be employed as power systems engineers, communication systems engineers and control system engineers within industrial areas.

**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 mechatronic 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 mechatronic engineering Department and becomes effective upon the decision of the Engineering Faculty Board and approval of the University Senate. The mechatronic engineering Program takes four years and leads to a Bachelor's degree of Science in mechatronic engineering. The Bachelor's degree requires the completion of **240 ECTS** credits. The curriculum of the Bachelor's Degree in mechatronic engineering was planned according to recommendations of ASIIN's subject-specific criteria (The Technical Committee 02, TC 02 and The Technical Committee 04, TC 04) and recommendations of The Association for Computing Machinery (ACM), and The Electrical & Electronic Society (IEEE-EES)1. 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 computer science and mechatronic engineering obligatory courses, studies of mechatronic engineering electives courses, bachelor's thesis and practical training.

**Table 1**: Curricular categories of the program

| Category | Notation | Credit | Weight, % |
|---|---|---|---|
| Mathematics | MT | 24 | 16.6 |
| Basic Science | BS | 12 | 8.3 |
| English Composition & Social Science | ECS | 17 | 11.7 |
| Computer Science | CS | 6 | 4.1 |
| Obligatory mechatronic engineering Courses | OEEE | 54 | 37.2 |
| Elective mechatronic engineering Courses | EEEE | 24 | 16.6 |
| Bachelor's Thesis | BT | 8 | 5.5 |
| Summer Internship | SI | - | - |
| | Total | 145 | 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
  * 4 credit hour = 4 "hour" of lecture per week
  * 3 credit hour = 3 "hour"of lecture per week

* 1 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 byelective subject choices. In the Bachelor’s Degree Program the portion of elective studies is 16.6%. In exceptional cases, the elective subject can be chosen from other degree programs, ifit is suitable for the degree. The application has to be approved by the Head of mechatronic engineering department. With technical respect free electives on offer, students of theBachelor’s degree program may choose a certain specialization track to get a moredistinguished qualifications profile.

**Teaching methods:** The Bachelor’s program is full-time, on-campus program. The teachingmethods applied in the Degree Program in mechatronic engineering include lectures, classroomand laboratory exercises, computer training, different kinds of assignments, seminars,excursions, and Case-exercises. The courses also involve group and project work which trainthe social competences of the students.

The Department of mechatronic engineering appreciates modern concepts and new methods inteaching and education methods that support educational objectives in addition to traditionalmethods. Traditional class attendance is compulsory for all courses except graduationprojects. Problem solving sections of knowledge based courses are integrated with the theorysections.

The Department of mechatronic engineering aims to reach its educational objectives by usingseveral teaching methods. Both the traditional and modern teaching methods are employed atthe 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 allthe courses. Lectures are conducted using standard computer based presentations in the formof pre-prepared slides. In addition, white boards and marker pens are used whenevernecessary 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 arepoints that they are not clear about. Electronic copies of the slides are sent to students by emailafter each class, and students are encouraged to go through the slides in their own timeand make sure that they understand all presented information.

In addition to traditional teaching methods, a variety of other methods are used to support theteaching. Most computer based learning requires the use of computers as part of the learningprocess. Students use the

departmental computer laboratories for their practical work in orderto improve their practical skills. Students use computers in the laboratory under thesupervision of either a teaching assistant or an instructor.

Educational methods used for the students can be classified into **teacher centered and studentcentered**. In **Teacher-Centered Approach**, the Teachers are the main authority figure. The primaryrole of the student is to passively receive information (via lectures and direct instruction) with an endgoal of testing and assessment. It is the primary role of teachers to pass knowledge and informationonto their students. In this model, teaching and assessment are viewed as two separate entities. Studentlearning is measured through objectively scored tests and assessments. In **Student-CenteredApproach**, the teachers are an authority figure, teachers and students play an equally active role in thelearning process. The teacher's primary role is to coach and facilitate student learning and overallcomprehension of material. Student learning is measured through both formal and informal forms ofassessment, including group projects, student portfolios, and class participation. Teaching andassessments 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**

- mechatronic engineer(MCT) (Bachelor's Degree/ first cycle in Bologna System)
- Level of Qualification: Qualifications Framework- European Higher Education Area (QFEHEA):1

5. **Access requirement(s)**

The admissions and entry requirements ensure that the students who are admitted to thedegree program possess the required competences. Bachelor's degree modules are fully taughtin 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 studiessuccessfully and obtain high school graduation diplomas.

Local students must sit for the Near East University entrance examination and obtain a passmark from this examination. Successful students are admitted to the university, but not necessarily to the mechatronic engineering department.

Students from Turkey must select the Near East University and the mechatronic engineering department as their choice, and they must obtain successful pass marks from the Turkishuniversity entrance examinations (prepared

and administered by the Higher EducationCouncil of Turkey, YÖK). Those who obtain the required marks are admitted to theuniversity, but not necessarily to the mechatronic engineering department.

Students from other countries are admitted to the university based on the results of their highschool graduation diplomas.

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

**6. Qualification Requirements**

145 Near East University Credits (Near East University Credit is contact hour based)which is total **243 ECTS credits** must be completed after being successful in the courses tobecome a graduate of the mechatronic engineering department.

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

ECTS also helps with the planning, delivery and evaluation of study programmes, andmakes 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 differencebetween the European Credit System ECTS and the US College Credit system is that thefirst is based on student workload and the second on contact hours. The ECTS is orientedtowards 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 fora 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-creditsystems-in-the-us.html).

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

The students who have successfully completed the programme should be able to bescience-based, skilled and competent **MECHATRONIC ENGINEERINGspecialist** prepared to meetthe challenges of practicing computer engineering in the 21st century, and **researchers** whoare prepared to conduct MECHATRONIC ENGINEERINGresearch focused on bettering the humancondition and advancing the fundamental understanding of computer engineering.

**8. Arrangements for transfer from another mechatronic engineeringdepartment (Recognition of Prior Learning)**

A student wishing a transfer from another university: the student must prove her/hisEnglish Proficiency if s/he wishes to attend the English Section. At the time of LYS examination the candidate's entrance score must not be less than the lowest score foradmission to the Near East University mechatronic engineering department. The transcript and coursecontent of the applicant is examined by the department and the student is then accepted tothe appropiate year of the programme.

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### 9. Examination Regulations, Assessment and Grading

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

At the commencement of the teaching term, students are informed as to examinationrequirements. All the examinations are done during the examination week. The lectures arecancelled during the examination week. Every effort is made to ensure that no more than oneexamination is taken by a student on the same day.
The assessment procedures, marking criteria, and examination regulations are available forthe students to examine if they wish so. The regulations cover the student absences due toillness, financial, or other reasons.

Written examinations are done for each module except the graduation projects. There aresome 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 finalexamination. The mid-term examinations are done around 6 weeks after the start of a newsemester. The final examinations are done at the end of each semester. The examination datesare 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-upexams 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 forthe duration of their graduation projects. Students can carry out their graduation projectexternally 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 thedepartmental staff according to the topic of the presentation and there must be at least 2members 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 5minute 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, andthe content of the project. Each jury member fills in a separate assessment form. The finalgrading 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 | 3,30 - 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) |

**11. Occupational Profiles of Graduaotes**

Graduates of the Department of mechatronic engineering have been employed in related jobs in countries all over the world. Our graduates can be employed as power systems engineers, communication systems engineers and control system engineers within industrial areasand in a variety of private and public establishments.

The Department of mechatronic engineering has good relations with the governmental andprivate organizations and companies in North Cyprus and Turkey, thereby ensuring up to datestudy 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 regionalrequirements, the demand of employers, international organizations and job marketrepresentatives.

The modules in the degree structure are also closely linked to the research conducted in thedepartment and provide a path to post graduate studies. Moreover, a large majority ofBachelor's projects are completed in cooperation with industry in various projects either at theuniversity or in companies, and thus provide a link to the professional field and a path tofuture 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 ofmechatronic engineering.

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

**12. Programme Director**

Assoc. Prof. Dr. Selim Solmaz (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 computing requirements appropriate to its solution.
3. Ability to apply mathematical foundations, algorithmic principles, and computer engineering 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 computer 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.

## Faculty of Engineering Department of MECHATRONIC ENGINEERINGStudy Plan (BSc.)
## FRESHMAN

| FIRST YEAR - FALL SEMESTER | I. Semester | | |
|---|---|---|---|
| **Course Code** | **Course Name** | **Credits /ECTS** | **Prerequisite** |
| ECC103 | Engineering Drawing I | 3 / 5 | - |
| ENG 101 | English I | 3 / 4 | - |
| MTH 101 | Calculus I | 4 / 6 | - |
| PHY 101 | General Physics I | 4 / 6 | - |
| ECC 101 | Computer Programming | 3 / 5 | - |
| YİT 101 | Turkish for Foreign Students | 2 / 3 | - |
| AİT 101 | Atatürk's Principles & Turkish Reforms | 2 / 3 | - |
| | | 19 / **29** | |

| FIRST YEAR –SPRING SEMESTER | II. Semester | | |
|---|---|---|---|
| **Course Code** | **Course Name** | **Credits /ECTS** | **Prerequisite** |
| ENG 102 | English II | 3 / 6 | ENG 101 |
| MTH 102 | Calculus II | 4 / 6 | MTH 101 |
| CHM 101 | General Chemistry | 4 / 6 | - |
| PHY 102 | G. Physics II | 4 / 6 | PHY 101 |
| ECC 108 | Object Oriented Programming | 3 / 5 | ECC 101 |
| MCT100 | Introduction to MCT Engineering | 1 / 3 | - |
| | | 19 / **32** | |

## SOPHOMORE

| SECOND YEAR - FALL SEMESTER | III. Semester | | |
|---|---|---|---|
| **Course Code** | **Course Name** | **Credits /ECTS** | **Prerequisite** |
| ECC 216 | Circuit Theory I | 4 / 5 | PHY 102, MTH 102 |
| ECC 211 | Engineering Materials | 3 / 5 | - |
| ECC 206 | Statics | 4 / 6 | PHY 101 |
| MTH 113 | Linear Algebra | 3 / 5 | - |
| MCT 201 | Mechanical Workshop Practice | 3 / 5 | - |
| NTE | Non-Technical Electives | 3 / 6 | - |
| | | 20 / **32** | |

| SECOND YEAR - SPRING SEMESTER | IV. Semester | | |
|---|---|---|---|
| **Course Code** | **Course Name** | **Credits /ECTS** | **Prerequisite** |
| ENG 201 | English Communication Skills | 3 / 5 | ENG 102 |
| MCT 200 | Summer Trainning I | 0 / 4 | - |
| ECC 218 | Electronics I | 4 / 6 | ECC 216 |
| ECC 008 | Signal and Systems | 4 / 6 | ECC 216 |
| MTH 201 | Differantial Equations | 3 / 5 | MTH 101 |
| ECC 213 | Strength of Materials I | 4 / 6 | ECC 206 |
| | | 17 / **32** | |

## JUNIOR

| THIRD YEAR - FALL SEMESTER | V. Semester | | |
|---|---|---|---|
| **Course Code** | **Course Name** | **Credits /ECTS** | **Prerequisite** |

| | | | |
|---|---|---|---|
| ECC 001 | Logic Circuit Design | 3 / 6 | EEC 218 |
| MCT 301 | Mech. Components&Instrumentations | 3 / 5 | |
| ECC 207 | Thermodynamics | 4 / 7 | CHM 101 |
| ECC 212 | Dynamics | 3 / 6 | PHY 101 |
| ECC 209 | Manufacturing Technology | 3 / 5 | |
| | | 13 / **29** | |

| **THIRD YEAR -SPRING SEMESTER** | **VI. Semester** | | |
|---|---|---|---|
| **Course Code** | **Course Name** | **Credits /ECTS** | **Prerequisite** |
| ECC 301 | Microprocessors | 4 / 6 | ECC 001 |
| ECC 013 | Engineering Drawing II | 4 / 6 | ECC 103 |
| ECC 310 | Control Systems | 3 / 5 | MTH 201 |
| MCT 311 | Machine Elements | 4 / 6 | ECC 213 |
| NTE | Non-Technical Elective | 3 / 5 | - |
| MCT 300 | Summer Training II | 0 / 4 | MCT 200 |
| | | 18 / **32** | |

## SENIOR

| **FOURTH YEAR - FALL SEMESTER** | **VII.Semester** | | |
|---|---|---|---|
| **Course Code** | **Course Name** | **Credits /ECTS** | **Prerequisite** |
| MCT 410 | Introduction to Capstone Design | 1 / 0 | |
| TE 4.. | Technical Electives | 3 / 5 | |
| TE 4.. | Technical Electives | 3 / 5 | |
| ECC 429 | Engineering Ethitcs | 3 / 5 | |
| ECC 426 | Engineering Economy | 3 / 6 | |
| MTH 251 | Probability and Statistics | 3/6 | MTH 102 |
| | | 16 / **27** | |

| **FOURTH YEAR –SPRING SEMESTER** | **VIII. Semester** | | |
|---|---|---|---|
| **Course Code** | **Course Name** | **Credits /ECTS** | **Prerequisite** |
| MCT411 | Capstone Team Project | 3 /6 | |
| EE 457 | Robotic System | 4 / 6 | |
| TE 4.. | Technical Electives | 3 / 5 | |
| TE 4.. | Technical Electives | 3 / 5 | |
| TE 4.. | Technical Electives | 3 / 5 | |
| | | 16/ **27** | |

* AIT101 is a module for Turkish students.
* YİT 101 is a module for foreign students
In first semester AIT101 Atatürk's Principles Reforms course is designated for the students of Turkish nationality, the course YİT 101 Turkish for Foreigners – for oversee students (foreigners).

**Restricted Elective (RE) Courses**

| | |
|---|---|
| ECC 426 | Engineering Economy |
| ECC 427 | Management for Engineers |

**Technical Elective (TE) Courses**

| | **Telecommunication Major** | **Credit** | **Prerequisite** |
|---|---|---|---|
| EE412 | Radar Systems | 3 | ECC 008, MTH251 |
| EE416 | Computer Networking | 3 | ECC 008 |
| | **Control Major** | | |
| EE424 | Process Control Instrumentation Technology | 3 | EE324 |
| EE451 | Digital Electronics | 3 | ECC 001 |
| EE454 | Digital Control Systems | 3 | EE324 |
| EE470 | Programmable Logic Controllers | 3 | ECC 001 |
| | **Power Major** | | |
| EE433 | Power Electronics | 3 | EE321, EE331 |
| EE471 | Power System Analysis I | 3 | EE331 |
| EE473 | Power System Protection | 3 | EE471 |
| EE474 | Static Power Conversion | 3 | EE433 |
| EE475 | High Voltage Techniques I | 3 | * |

* Consent of the instructor

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

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

- To acquire a strong foundation in Computer 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 computer engineering
- Improve knowledge and skills through lifelong learning and graduate studies.

The individual courses are described below. These courses are offered by the MECHATRONIC ENGINEERINGDepartment together with the objective of each module.

**FIRST YEAR**

ECC 101 Computer Programming, 3 Credits, 5 ECTS

**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**

Algorithm development. Elements of C. Structure of a C program, data types, constants, input and output of integer numbers, real numbers. Variables, expressions and assignments. Input and output functions. Control Structures. Selection- If statement, multiple selection- switch statement. Iteration- while, do-while, for operators. User-defined functions, arrays and subscripted variables, single and multi dimensional arrays. Array and functions. Pointers, pointers and strings. Structures, creating structures. Structure as function argument. Subprograms. Files. File operations.Application programs will be developed in a laboratory environment using the C language.

ENG 101 English I, 3 Credits, 4 ECTS

**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 Descriptions.**

This course offers intermediate levels include wide range of grammatical structures and vocabulary of English in order to built onto the foundation established at the Preparatory School. This course aims to bring the students to a level that will enable them fulfill the requirements of main courses of their departments. Students will be encouraged to read a variety of texts as well as chapters from textbooks so that they can pursue their undergraduate studies at the university without major difficulty. ENG 101 is designed to improve the students' presentation ability. Students are expected to do an oral presentation. At the end of the course they submitted their written projects.

MTH 101 Calculus I, 4 Credits, 6 ECTS

**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:**

Limits and continuity. Derivatives. Rules of differentiation. Higher order derivatives. Chain rule. Related rates. Rolle's and the mean value theorem. Critical Points. Asymptotes. Curve sketching. Integrals. Fundamental Theorem. Techniques of integration. Definite integrals. Application to geometry and science. Indeterminate forms. L'Hospital's Rule.

PHY 101 General Physics I, 4 Credits, 6 ECTS

**Objectives of the Course:**

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

**Course Description**

A basic physics course which study mechanic phenomenas. . Topics include the description of motion, forces, gravitation, work, and energy, momentum, rotational motion, and Static equilibrium. Laboratory work is an important component of the course.

ENG 102 English II, 3 Credits, 6 ECTS

**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 Descriptions:**

This course offers the students a wide range of grammatical structures and key language and vocabulary of English in the technical, industrial, and scientific sectors at intermediate level for everyday communication at work. This course aims to bring the students to a level that will enable them to fulfill the requirements of the main courses of their departments. The ability to evaluate, analyze and syn the size information in written discourse will be high lighted. Documentation in writing will be introduced at the beginning of the course, in order to solidly establish the skill by the end. Students will learn the discourse patterns and structures to be used in differentes say types that they need for real life, hands-on tasks like explaining process, organizing schedules, reporting or progress,or analyzing risk.

MTH 102 Calculus II, 4 Credits, 6 ECTS

**Course Descriptions:**

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,extrema of functions of several variables.Multible integrals:Double integrals,Area,volume,double integral in polar coordinates,surface area,triple integrals,spherical and cylindrical coordinates.

CHM 101 General Chemistry, 4 credits, 6 ECTS

**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**

Matter and measurement; atoms, molecules and ions; mass relations in chemistry, stoichiometry; gases; electronic structure and the periodic table; covalent bonding; thermochemistry; acids and bases.

PHY 102 General Physics II, 4 Credits, 6 ECTS

**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:**

A basic physics course which study electric and magnetic phenomenas. Topics include electricity, magnetism, and direct current circuits. Laboratory work is an important component of the course.

ECC 103- EngineeringDrawingI3 credits 5 ECTS:

**Course Description:**

IntroductiontoCAD. Principlesof engineering drawing(1stand 3rdangleorthotropicprojections),drawingmethodologystages, lineworkandlettering,isometricandobliqueprojections,drawinglayouts(working drawings andassembly drawings),machinedrawingfeatures,sectionsandsectionalviews,geometrical constructions and dimensioningprinciples.

MCT100 Introduction to Mechatronics Engineering 1 credit, 3ECTS:

**Course Description:**

This course aims to familiarize first year mechatronics engineering students by introducing them to the fundamentals of discipline; job opportunities for mechatronics engineers; basic study skills; an overview of fundamentals laws and principles of mechatronics engineering; introduction to problem layout and problem solving methods; simplified engineering modeling and analysis of mechatronics systems; collection, manipulation and presentation of engineering data; ethical issues; and the importance of computers and language skills for effective communication.

**SECOND YEAR**

ECC 216 Circuit Theory I , 4 Credits, 5 ECTS

**Objectives of the Course:**

Introduce students the fundamentals of circuit theory

**Course Description**

This course studies the System of units. Charge, current, voltage and power. Types of circuits and circuit elements. Ohm's law. Kirchhoff's law. Analysis methods, Inductance and capacitance. The unit-step forcing function. The natural and forced response of the first-order and second-order circuits.

MCT200– Summer TrainingNon-credit ,4 ECTS:

**Course Description**

Thisistobe completedinthe Department's workshops by allMEstudents.Studentswillspendatleast80hoursintheworkshops,and perform varioushandandmachine tooloperationsunder staff supervision.Atthe endof the trainingstudents will be required to completeareport regardingtheir training.

ECC206- Statics4credits, 6 ECTS:

**Course Description**

Compositionand resolutionofforces,equilibriumofparticles andrigidbodies,centroidsandcenter ofgravity.Analysisoftrusses,framesandmachines. Moments and products of inertia, method ofvirtual work. Friction.

ECC211 -EngineeingMaterials 4credits, 6ECTS:

Materials and properties. Atomic structure and interatomic bonding,crystal structure, crystalimperfections, solid solutions. Mechatronic properties of materials, elastic and plasticdeformation. Behaviour ofmaterials under tension, compression and shear.Hardnessand hardness measurement. Dislocation and strengthening mechanism. Phase equilibria,phasediagrams, theiron–carbonsystem, solid reactions, microstructures. Structure and properties of ceramics. Polymer structure.

ECC 108–Object Oriented Programming 3 credits 4 ECTS:

Fundamental ideas, object-oriented concept, meaning of modeling the real world. Encapsulatıon, Information hiding. Abstraction, Classes, Constructors, Default, parameterized, copy constructors. Metaclass, Object lifetimes, Dynamic objects, Inheritance, Single and Multiply inheritance, Inheriting constructor, Associations and Aggregations, Polymorphism, Operator overloading, Virtual Function, Friend functions, Streams and files, File organisation.Classtemlates.

MTH 113 Linear Algebra, 3 Credits, 6 ECTS

**Objectives of the Course:**

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

**Course Description**

System of linear equations: elementary row operations, echelon forms, Gaussian elimination method. Matrices: elementary matrices, invertible matrices. Determinants: adjoint and inverse matrices, Crammer's rule. Vector spaces: linear independents, basis, dimension. Linear mapping. Inner product spaces: Gram-Schmit ortogonalization. Eigenvalues and eigenvectors, Cayley-Hamilton theorem, diagonalization.

MCT 201 Mechatronic Workshop Practice 3 credits 5 ECTS:
**Course description**

This is to be conducted in the Mechatronic Engineering Department's workshops by all MechatronicEngineering students who have completed a minimum of three semesters in the program. Students will perform various hand and machine tool operations under staff supervision. It includes introduction to engineering materials, and selected practices on laying-out and setting out a job, using measuring devices. At the end of the training students will be required to complete a report regarding their training.

ECC 008 Signals and Systems, 4 Credits, 7 ECTS
**Objectives of the Course:**
Teaching the basic of Signals and Systems. To understand mathematical descriptions and representations of continuous and discreet time signals and systems.To develop input-output relationships for Linear Time Invariant Systems (LTIS). To understand the impulse response of a system and the convolution operator.To teach analysis of the signals in time domain, z domain and frequency domain. To teach Fourier and Laplace Transform analysis for continuous-time LTIS. To teach z-Transform analysis for discrete time systems. To understand sampling theory; To teach the basic of filtering, the basic of feedback concepts. To provide a modeling of the systems in time domain, z domain and frequency domain using software programs
**Course Description**
The following main topics are covered: Classifications of signals, basic operations on signals, elementary signals, properties of systems, impulse response, convolution, step response, systems described by differential and difference equations, frequency response, Fourier series and transform, Fourier analysis of discrete-time signals and systems, properties of Fourier representations, Fourier representations for mixed signal classes, sampling, reconstruction, z-Transform

ENG 201 English Communication Skills, 3 Credits, 6 ECTS
**Objectives of the Course:**
**Reading:** to develop the skill of reading for information from a wide variety of authentic Engineeringtexts. 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.
**Speaking:** to develop the ability to participate in exchanges of information and opinions in the context of IT and Engineering, provide explanations of features of Mechanical, Computer, Electronics, Biomedical, Food and Automotive Engineering. To develop communication skills for the job market which is becoming increasingly common to have give presentation in English.
**Writing:** to write instructions, descriptions and explanations about topics in Engineering. Write a cover letter and interview winning C.V.

**Language :** to consolidate and extend the student's understanding and use of structures and function common to Engineering at intermediate and advanced levels. Through the chosen texts they can learnalso the vocabulary and expression that need when giving oral presentation. Giving a presentation in a foreign language is real challenge, even for those who have a good knowledge of the language.

**Course Description**

To reinforces and consolidates the language and 4 skills that students have learned from earlier courses, as well as developing their level of knowledge, communicative capacity, and ability to analyse and reflect on language. Course on upper -intermediate AND ADVANCED levels include interesting and up-to-date topics, encouraging students to recognize the importance of acquiring a foreign language in a modern context, prepare them to for their future professional life.

ECC 213- StrengthofMaterialsI4credits 6 ECTS:

**Course Description**

Introduction.Internalforcediagrams.
Analysisofstressandstrain.Hooke'slaw.Yieldcriteriaandplasticity.Axialforce.Pure shear. Torsionof circular barsandthinwalledtubes.Momentof inertia of cross-sections. Simple bending.

MTH 201 Differential Equations 4 Credits, 6 ECTS

**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, Implicit Solution. First-order differential equations, separable, homogenous differential equations, exact 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 equation.

**THIRD YEAR**

ECC 001 Logic Circuit Design, 3 Credits, 5 ECTS

**Objectives of the Course:**

To develop a thorough understanding on combinational digital circuit design using logic gates. To develop a thorough understanding on sequential digital circuit design using flip flops. Simplify logic functions using Boolean algebra methods. Simplify logic functions using Karnaugh maps. Design of digital building blocks such as adders, multiplexers and decoders. Analysis of number systems

**Course Description**

Topics include number systems, Boolean algebra, truth table, minterms, maxterms, don't cares, Karnaugh maps, multi-level gate circuits, combinational circuit design, gate delays, timing diagrams, hazards, multiplexers, decoders, programmable logic devices, latches, flip-flops, registers, counters, analysis of clocked sequential circuits, Mealy machine, Moore machine, derivation of state graphs and tables.

MCT 301 Mechatronics Components and Instrumentation 3 credits, 5 ECTS:

**Course Description**

Basic applied concepts in mechatronic components and instruments. Mechatronic components, systems, instrumentation, transducers and sensors. Hands on experiments on: identification and classification of mechatronic components, sensors and transducers, machine vision, actuating systems, information and cognitive systems, mechatronic instrumentation, evaluation ofmechatronic systems.

ECC 218 Electronics I, 4 Credits, 6 ECTS

**Objectives of the Course:**

- Provide students with knowledge of semiconductors and their applications
- Explain the diodes and their applications
- Provide the knowledge of BJTs, their applications and analysis
- Explain the different applications and importance of BJT in electronics

**Course Description**

Understanding the basics of semiconductor technology and elements. Identify and explain diodes and their applications, switching and rectification of AC signals. understanding different clippers and clampers circuits. Understanding the theory of Bipolar Junction Transistor operation, CB, CE and CC configurations. Studying BJT bias circuits. FET operation and biasing. Applying small signal BJT and FET analysis using re- and h-parameters. Studying amplifier frequency response.

MCT 311 Machine Elements 3 credits 6 ECTS:

**Course Description**

The course covers fundamentals of machine design which include: general design rules, load analysis, materials selection, stress, strain and deflection anal mechatronics components, sensors, instrumentation analysis, failure theories, the concepts of reliability and safety, tolerances and fits; and introduces design guidelines, mathematical models and equations for: fasteners and power screws, springs, bearings, gears, shafts, clutches and brakes, and chain drives. Students will have an opportunity to work on a design project using learned knowledge.

ECC 013-EngineeringDrawingII4credits, 6 ECTS:

**Course Description**

WorkingwithCAD,screwthreadsand threadedfasteners,lockingandretaining devices,keysandkeyways,limitsandfits,unilateral andbilaterallimits,geometricaltolerancing andapplications,gears,springsandspring calculations, weld typesand symbols, dimensioning, bearings.

ECC 310-ControlSystems3 credits, 5ECTS :

**Course Description**

Introductiontoautomaticcontrol.Mathematical modelling ofdynamicsystems.ResponseanalysisusingLaplacetransformmethod.Transfer functionsandblock systems.Feedbackcontrolsystems.Typicalactuatorsandtransducers. Control law.

MTH 251 Probability and Random Variables, 3 Credits, 6 ECTS

**Objectives of the Course:**

Understanding the concept of data analysis. Understanding the concept of probability and the conceptof random variables. Understanding the difference between discrete and continuous random variables.Understanding the concepts of expectation, variance and standard deviation. Understanding theconcepts of probability mass functions and cumulative distribution function for

discrete, continuousand joint distributions. Understanding and learning the different types of discrete and continuous distributions.

**Course Description**

Probability and counting, permutation and combination. Some probability laws, Axioms of probability. Random variables and discrete distributions. Continuous distributions. Joint distributions. Mathematical Expectation, Some Discrete Probability Distributions, Some Continuous Probability Distributions.

MCT300-SummerTrainingNon-credit 4 ECTS:

**Course Description**

Thisisaperiodcomprising aminimum of30 daystraining to becompletedinanindustrialorganization by allstudentswhoareeffectively intheir junior or senioryear. Studentsshouldobtainapprovalof theDepartmentbefore commencingtraining.Followingthistraining,studentswillberequiredtowriteaformal report andgiveashort presentation beforeacommitteeregardingtheirtraining.

ECC207-ThermodynamicsI 4credits, 7 ECTS:

**Course Description**

Basicconceptsanddefinitionsofclassical thermodynamics. Thermodynamicprocesses, work and heat interactions. First law for systems and for flow processes. Second lawand entropy,irreversibilityand availability.

ECC212 -Dynamics 3credits, 6 ECTS:

**Course Description**

A studyof motion particles and rigid bodies. Application of Newton's second lawto planar motions of rigid bodies, energyand momentumprinciples. Free, forced and dampedvibrations of particle. Central forcemotions.Inertia tensor. Euler's equation ofmotion.

ECC 301 Microprocessors, 4 Credits, 6 ECTS

**Objectives of the Course:**

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

**Course Description**

Introduction to microprocessors. Architecture of microprocessors and instruction sets. Interrupts. Memories. Parallel and serial input/output programming. Microprocessor based system design. Microprocessors applications.

**FOURTH YEAR**

MTH 251 Probability and Random Variables, 3 Credits, 6 ECTS

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

MECT410 Introduction to Capstone Design, 1 credit 0 ECTS:
**Course Description**
The course aims to prepare the senior year students for their capstone design projects, and to provide guidance with the selection of their project advisors, topics and teams The students are introduced to the basic features of the Capstone Design process, elements of a Capstone Project Report and written oral presentation techniques.
Probability and counting, permutation and combination. Some probability laws, Axioms of probability. Random variables and discrete distributions. Continuous distributions. Joint distributions. Mathematical Expectation, Some Discrete Probability Distributions, Some Continuous Probability Distributions.

ECC 429-Engineering Ethics, 3 credits, 5 ECTS:
**Course Description**
An Overview of Ethics, Ethics for IT Professionals, Computer and Internet Crime, Privacy, Freedom of Expression, Intellectual Property, Software Development, The Impact of Information Technology on the Quality of Life, Social Networking, Ethics of IT Organizations.

MECT411-Capstone Team Project, 3 credits, 6 ECTS:
**Course Description**
The purpose of the course is to develop an understanding of independent research through the study of a particular Mechatronics Engineering topic of interest. The special project is an exercise in the professional application of specialist skills and experience developed in Mechatronics Engineering program. Research topics, which may be principally experimental, theoretical or applied, will be chosen in consultation with a project supervisor.
EE 412 Radar Systems, 3 Credits, 5 ECTS
**Course description:**
General design principles and performance evaluation of pulsed radars. Statistical detection theory and radar cross-section of targets. CW, FM and Doppler radars. Target tracking radars. Radar receiver design. High power microwave generation and amplification; Radar antennas. Detection of radar signals in noise and waveform design. Propagation of radar waves.

EE 424 Process Control Instrumentation Technology, 3 Credits, 5 ECTS
**Course description:**
Process control characteristics. Analog and digital signals conditioning. Thermal, mechanical, optical sensors and design considerations. Final control. Discrete-state process control. Controller principles. Controllers. Control loop characteristics. Industrial control networks. Servomotor technology in motion control systems. Robots.

EE 451 Digital Electronics, 3 Credits, 5 ECTS

**Course description:**

Introduction to ICs. Logic families. Small- and large-scale integrations. Decoders, multiplexers,memories. Programmable logic devices. Digital-to-analog and analog-to-digital converters.

EE 454 Digital Control Systems, 3 Credits, 5 ECTS

**Course description:**

Introduction to sampled data systems. Discrete modelling of systems. Z-transforms. Second orderdiscrete systems. Stability. Root-locus in the z-plane, Bode diagrams in the z-plane, Nyquistdiagrams in the z-plane. Compensation techniques. PID-controllers.

EE 457 Robotic Systems, 3 Credits, 5 ECTS

**Course description:**

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

EE 470 Programmable Logic Controllers, 3 Credits, 5 ECTS

**Objectives of the Course:**

Introduction to programmable logic controllers

**Course Description:**

Conventional relay system, contact logic, PLC Structure, operating system, Ladder and Statement list programming \ releasing basic logic functions by PLC, PLC communication, applications.

EE433 Power Electronics, 3 Credits, 5 ECTS

**Objectives of the Course:**

Introducing electronic applications for the transformation and control of electrical power. Teaching the operational principles and analysis of various power converters.

**Course Description:**

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

EE471 Power System Analysis I, 3 Credits, 5 ECTS

**Objectives of the Course:**
Introduction to transmission lines and power system modeling
**Course Description:**
General structure of electric power systems. Electrical characteristics of transmission lines, transformers and generators: series impedance and capacitance of transmission lines, current-voltage relations on a transmission line for short, medium and long lengths. System modelling of synchronous machines, transformers, transmission lines and loads. Representation of power systems. Per unit analysis of power systems. Power circle diagram. Travelling waves, reflections. Symmetrical three-phase faults. Symmetrical components. Unsymmetrical components.

EE 472 Power System Analysis II, 3 Credits, 5 ECTS
**Objectives of the Course:**
- To teach Symmetrical Components for analyzing unbalanced voltage and currentphasors
- To analyze Unbalanced Faults on Unloaded Generators
- To teach Unsymmetrical Fault Analysis on Power Systems.
- To study Load Flow on Power Systems.

**Course Description:**
Symmetrical components. Positive, negative and zero-sequence networks of power systems. Unsymmetrical faults on power systems; single line to ground, double line to ground and line to line fault analysis. Faults through impedances . Faulty operation of Circuit Breakers. Basic Load Flow Equations. Load flow analysis.

EE 473 Power System Protection, 3 Credits, 5 ECTS
**Objectives of the Course:**
- To teach Basic concepts of protection for power systems
- To give information on Over-current, differential and impedance protection systems
- To study Generator , Transformer and Line Protection

**Course Description:**
Basic Concepts of Power System Protection Systems are studied. Topics are : Principles of Power System Protection. Current and Voltage Transformers. Over-current , differential and impedance protection systems. Transformer, generator and line protections

EE 474 StaticPower Conversion, 3 Credits, 5 ECTS
**Course description:**
Power switches. Power converters. VTA method. Midpoint and bridge rectifiers. Introduction toforced commutated circuits. Centretap inverter. Voltage-fed inverters. Current-fed inverters. DC-DCswitching converters. Series and parallel operation of switching elements.

EE 475 High Voltage Techniques I, 3 Credits, 5 ECTS
**Objectives of the Course:**
- To teach the basic concepts of breakdown mechanisms in insulating materials
- To investigate pre-breakdown phenomena in gaseous insulation and partial discharges
- To teach Townsends and Streamer breakdown mechanisms
- To study breakdown in solid and liquid insulation.

**Course Description**

Breakdown mechanisms in insulating materials are studied. Topics are; I-V characteristics of gases. Electron emission processes. Ionization and deionization. Townsend and Streamer breakdown mechanisms. Breakdown in electronegative gases. Corona discharges and loses. Breakdown mechanisms in solid and liquid insulations

ECC 426 Engineering Economy, 3 Credits, 5 ECTS

**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

**Course Description**

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 relationships. Depreciation. Money and banking. Price changes and inflation. Business and company finance

ECC 427 Management for Engineers, 3 Credits, 5 ECTS

**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,

**Course Description**

Principles of management. Functions of managers. Organisation and the environment. Marketing management. Production management. Personnel management. Managerial control. Accounting and financial reports. Budgetting 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 ofcharge. 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 MODEL

**Diploma No: 26785** **Diploma Date:** 06.02.2015

## 1.INFORMATION IDENTIFYING THE HOLDER OF THE QUALIFICATION

**1.1.** ***Family name(s): NADA***

**1.2.** ***Given name(s): JABER***

**1.3.** ***Place and date of birth: SYRIA -15.04.1989***

**1.4.** ***Student identification number: 20133818***

## 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***
ELECTRICAL AND ELECTRONIC 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 2.00/4.00 and no failing grades (below DD).

**4.3.** ***Objectives***
Educate and train students to demonstrate ability to research, analyze and present scientific and technological concepts and data in a precise and logical manner; knowledge and understanding the functions and operations of the industry; knowledge or the scientific and technological factors involved in the sector and ability to integrate and apply such knowledge in the management of operational activities; ability to adapt professionally in a rapidly changing society; their perspectives with respect to social issues, responsibilities and ethics.

***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: 2.79 / 4.00

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

1 ( 1st Semester)

| Course Code | Course Name | CR | ECTS | Status | Grade |
|---|---|---|---|---|---|
| ECC103 | Engineering Drawing I | 3 | 5 | Compulsory | E |
| ENG101 | English I | 3 | 4 | Compulsory | E |
| MTH101 | Calculus I | 4 | 6 | Compulsory | E |
| PHY101 | General Physics I | 4 | 6 | Compulsory | E |
| ECC 101 | Computer Programming | 3 | 5 | Compulsory | E |
| YİT 101 | Turkish for Foreign Students | 2 | 3 | Compulsory | S |
| AİT 101 | Atatürk's Principles & Turkish Reforms | 2 | 3 | Compulsory | S |
| | | | | | |
| | | 19 | 29 | | |

2 ( 2nd Semester)

| Course Code | Course Name | CR | ECTS | Status | Grade |
|---|---|---|---|---|---|
| ENG 102 | English II | 3 | 6 | Compulsory | BB |
| MTH102 | Calculus II | 4 | 6 | Compulsory | E |
| CHM101 | General Chemistry | 4 | 6 | Compulsory | DC |
| PHY 102 | G. Physics II | 4 | 6 | Compulsory | E |
| ECC108 | Object Oriented Programming | 3 | 5 | Compulsory | E |
| MCT100 | Introduction to MCT Engineering | 1 | 3 | Compulsory | E |
| | | | | | |
| | | | | | |
| | | 19 | 32 | | |

3 ( 3rd Semester)

| Course Code | Course Name | CR | ECTS | Status | Grade |
|---|---|---|---|---|---|
| ECC 216 | Circuit Theory I | 4 | 5 | Compulsory | E |
| ECC 211 | Engineering Materials | 3 | 5 | Compulsory | BA |
| ECC 206 | Statics | 4 | 6 | Compulsory | CC |
| MTH113 | Linear Algebra | 3 | 5 | Compulsory | DC |
| MCT201 | Mechanical Workshop Practice | 3 | 5 | Compulsory | E |
| NTE | Non-Technical Electives | 3 | 6 | Elective | AA |
| | | | | | |
| | | | | | |
| | | 20 | 32 | | |

4 ( 4th Semester)

| Course Code | Course Name | CR | ECTS | Status | Grade |
|---|---|---|---|---|---|
| ENG201 | English Communication Skills | 3 | 5 | Compulsory | E |
| MCT200 | Summer Trainning I | 0 | 4 | Compulsory | E |
| ECC 218 | Electronics I | 4 | 6 | Compulsory | E |
| ECC 008 | Signal and Systems | 4 | 6 | Compulsory | E |
| MTH201 | Differantial Equations | 3 | 5 | Compulsory | DC |
| ECC 213 | Strength of Materials I | 4 | 6 | Compulsory | S |
| | | | | | |
| | | | | | |
| | | 18 | 32 | | |

5 ( 5th Semester)

| Course Code | Course Name | CR | ECTS | Status | Grade |
|---|---|---|---|---|---|
| ECC 001 | Logic Circuit Design | 3 | 6 | Compulsory | E |
| MCT 301 | Mech. Components&Instrumentations | 3 | 5 | Compulsory | E |
| ECC 207 | Thermodynamics | 4 | 7 | Compulsory | BA |
| ECC 212 | Dynamics | 3 | 6 | Compulsory | E |
| ECC 209 | Manufacturing Technology | 3 | 5 | Compulsory | E |
| | | | | | |
| | | | | | |
| | | 16 | 29 | | |

6 ( 6th Semester)

| Course Code | Course Name | CR | ECTS | Status | Grade |
|---|---|---|---|---|---|
| ECC 301 | Microprocessors | 6 | 6 | Compulsory | E |
| ECC 013 | Engineering Drawing II | 6 | 6 | Compulsory | E |
| ECC 310 | Control Systems | 5 | 5 | Compulsory | E |
| MCT 311 | Machine Elements | / 6 | 6 | Compulsory | E |
| NTE | Non-Technical Elective | 5 | 5 | Compulsory | AA |
| MCT 300 | Summer Training II | 0 | 4 | Compulsory | S |
| | | | | | |
| | | 18 | 32 | | |

7 ( 7th Semester)

| Course Code | Course Name | CR | ECTS | Status | Grade |
|---|---|---|---|---|---|
| MCT 410 | Introduction to Capstone Design | 1 | 0 | Compulsory | CC |

8 ( 8th Semester)

| Course Code | Course Name | CR | ECTS | Status | Grade |
|---|---|---|---|---|---|
| MCT411 | Capstone Team Project | 3 | 6 | Compulsory | AA |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TE 4.. | Technical Electives | 3 | 5 | Elective | E | | EE 457 | Robotic System | 4 | 6 | Compulsory | CC |
| TE 4.. | Technical Electives | 3 | 5 | Elective | CB | | TE 4.. | Technical Electives | 3 | 5 | Elective | E |
| ECC 429 | Engineering Ethitcs | 3 | 5 | Compulsory | CB | | TE 4.. | Technical Electives | 3 | 5 | Elective | E |
| ECC 426 | Engineering Economy | 3 | 6 | Elective | BB | | TE 4.. | Technical Electives | 3 | 5 | Elective | BA |
| MTH 251 | Probability and Statistics | 3 | 6 | Compulsory | BB | | | | | | | |
| | | | | | | | | | | | | |
| | | 16 | 27 | | | | | | 16 | 27 | | |

**TOTAL CREDITS 138 - TOTAL ECTS 240**

## 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 exercise the profession

## 6. ADDITIONAL INFORMATION

**6.1.** ***Additional information***

***6.2. Sources for further information***

***Faculty web site*** http://www.neu.edu.tr/en/node/6190
***Department web site*** http://www.neu.edu.tr/en/node/1052
***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

## 7. CERTIFICATION OF THE SUPPLEMENT

7.1. *Date* : 06.02.2015
7.2. Name and *Signature* : Ümit Serdaroğlu
7.3. *Capacity* : Registrar
7.4. *Official stamp or seal* :

## 8. 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 (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) - (önlisans derecesi) and first cycle (bachelor degree) - (lisans derecesi) 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) – (yüksek lisans derecesi) and third cycle (doctorate) – (doktora derecesi) 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