NEAR EAST UNIVERSITY
FACULTY OF ENGINEERING

DEPARTMENT OF
ELECTRICAL & ELECTRONIC ENGINEERING

COURSE CATALOGUE

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This course catalogue is developed to give information about the Electrical & Electronic Engineering programme to all who are interested in the Near East University, Department of Electrical & Electronic 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 Electrical & Electronic Engineering and the course programme.

Sincerely

Prof. Dr. Bülent Bilgehan

Chairperson

Electrical & Electronic Engineering (EEE) Programme

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

The Department of Electrical and Electronic Engineering was founded by Prof. Dr. Şenol Bektaş, 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 Electrical and Electronic 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 Electrical and Electronic 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.
- **Information on Education**

  Educational Programs (graduate, postgraduate studies)Undergraduate program of Electrical and Electronic Engineering Master of Science program of Electrical and Electronic Engineering PhD program of Electrical and Electronic Engineering.
- **Language of Instruction**

  Undergraduate Electrical and Electronic Engineering programs both in Turkish or English language are 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 Electrical & Electronic 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 Electrical & Electronic Engineering Department and becomes effective upon the decision of the Engineering Faculty Board and approval of the University Senate. The Electrical & Electronic Engineering Program takes four years and leads to a Bachelor's degree of Science in Electrical & Electronic Engineering. The Bachelor's degree requires the completion of **240 ECTS** credits. The curriculum of the Bachelor's Degree in Electrical & Electronic 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 Electrical & Eelctronic engineering obligatory courses, studies of electrical & electronic 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 Electrical & Electronic Engineering Courses	OEEE	54	37.2
Elective Electrical & Electronic 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 by elective 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, if it is suitable for the degree. The application has to be approved by the Head of Electrical & Electronic 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 Electrical & Electronic Engineering include lectures, classroom and laboratory exercises, computer training, different kinds of assignments, seminars, excursions, and Case-exercises. The courses also involve group and project work which train the social competences of the students.

The Department of Electrical & Electronic 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 Electrical & Electronic Engineering aims to reach its educational objectives by using several teaching methods. Both the traditional and modern teaching methods are employed at the department. Traditional teaching methods are face-to-face lectures and are class based, requiring all students to attend classes. At least 70% of class attendance is compulsory for all the courses. Lectures are conducted using standard computer based presentations in the form of pre-prepared slides. In addition, white boards and marker pens are used whenever necessary in order to explain difficult topics in greater detail, or to answer student questions. Students are encouraged to take notes during the presentations and ask questions

if there are points that they are not clear about. Electronic copies of the slides are sent to students by email 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

- Electrical & Electronic Engineer (EEE) (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 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 Electrical & Electronic Engineering Department.

Students from Turkey must select the Near East University and the Electrical & Electronic 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, YÖK). Those who obtain the required marks are admitted to the university, but not necessarily to the Electrical & Electronic 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

145 Near East University Credits (Near East University Credit is contact hour based) which is total **240 ECTS credits** must be completed after being successful in the courses to become a graduate of the Electrical & Electronic Engineering department.

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

ECTS also helps with the planning, delivery and evaluation of study programmes, and makes them more transparent (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-creditsystems-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 **Electrical & Electronic Engineering specialist** prepared to meet the challenges of practicing computer engineering in the 21st century, and **researchers** who are prepared to conduct electrical & electronic engineering research focused on bettering the human condition and advancing the fundamental understanding of computer engineering.

8. Arrangements for transfer from another Electrical & Electronic 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 LYS examination the candidate's entrance score must not be less than the lowest score for admission to the Near East University Electrical & Electronic Engineering Department. The transcript and course content of the applicant is examined by the department and the student is then accepted to the appropiate year of the programme.

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 6 weeks after the start of a new semester. The final examinations are done at the end of each semester. The examination dates are published in the university calendar at the beginning of each semester.

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

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

The graduation projects are completed in 2 semesters. Students are assigned supervisors for the duration of their graduation projects. Students can carry out their graduation project externally in the industry after approving their topic and supervisor by the department. Graduation project assessment consists of the preparation of a

bound report by the student, and also an oral presentation to jury members. The jury members are selected from the departmental staff according to the topic of the presentation and there must be at least 2 members at the jury. Students are expected to prepare slides and present their projects orally.

The presentation time is 10-15 minutes for each student. At the end of the presentation 5 minute time is allocated to questions. The assessment depends on the style of the presentation, command of the language, confidence of the student, the ability to answer the questions, and the content of the project. Each jury member fills in a separate assessment form. The final grading is taken to be the average grade given by all the jury members.

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 Electrical & Electronic 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 areas and in a variety of private and public establishments.

The Department of Electrical & Electronic Engineering has 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 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 Electrical & Electronic Engineering.

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

12. Programme Director

Prof. Dr. Bülent Bilgehan (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 Electrical & Electronic EngineeringStudy Plan (BSc.)
FRESHMAN

FIRST YEAR - FALL SEMESTER	**I. Semester**		
Course Code	**Course Name**	**Credits /ECTS**	**Prerequisite**
CHM 101	General Chemistry	4 / 6	-
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	-
		20 / **30**	

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
MTH 113	Linear Algebra	3 / 6	MTH 101
PHY 102	G. Physics II	4 / 6	PHY 101
TDE 102	Tech. Drawing and Elec. Appl.	3 / 5	-
EE 100	Introduction to EE Engineering	1 / 3	-
		18 / **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
EE 210	Computer Applications	3 / 6	ECC 101
EE 241	Electrical Materials	3 / 4	CHM 101
ENG 201	English Communication Skills	3 / 6	ENG 102
MTH 201	Differential Equations	4 / 6	MTH 102
NTE	Non-Technical Electives	3 / 6	-
		20 / **33**	

SECOND YEAR - SPRING SEMESTER	IV. Semester		
Course Code	**Course Name**	**Credits /ECTS**	**Prerequisite**
EE 202	Circuit Theory II	4 / 5	EE 201
EE 216	Electromagnetic Theory	3 / 5	PHY 102-MAT 102
EE 220	Electrical Measurements	3 / 5	EE 201
ECC 218	Electronics I	4 / 6	EE 201-EE 241
MTH 241	Complex Calculus	3 / 5	MAT 102
EE 200	Summer Training I	0 / 4	
		17 / **30**	

JUNIOR

THIRD YEAR - FALL SEMESTER	V. Semester		
Course Code	**Course Name**	**Credits /ECTS**	**Prerequisite**
ECC 001	Logic Circuit Design	3 / 5	EE 222
EE 321	Electronics II	4 / 6	EE 222
EE 331	Electromech. Energy Conv. I	4 / 5	EE 202-EE 216
ECC 008	Signals and Systems	4 / 7	EE 202
MTH 251	Prob. and Random Variables	3 / 6	MAT 102
		18 / **29**	

THIRD YEAR -SPRING SEMESTER	VI. Semester		
Course Code	**Course Name**	**Credits /ECTS**	**Prerequisite**
ECC 301	Microprocessors	4 / 6	EE 315
EE 324	Linear Control Systems	3 / 5	MAT 201-MAT 112
EE 346	Communication Systems	4 / 6	EE 341
MTH 323	Numerical Analysis	3 / 6	MAT 201
EE 332	Electromech. Energy Conv. II	3 / 5	EE 331
EE 300	Summer Training II	0 / 4	
		17 / **32**	

SENIOR

FOURTH YEAR - FALL SEMESTER	VII.Semester		
Course Code	**Course Name**	**Credits /ECTS**	**Prerequisite**
TE 4..	Technical Electives	3 / 5	
TE 4..	Technical Electives	3 / 5	
TE 4..	Technical Electives	3 / 5	
TE 4..	Technical Electives	3 / 5	
RE 4..	Restricted Elective	3 / 4	
EE 401	Engineering Design I	4 / 5	
		19 / **29**	

FOURTH YEAR –SPRING SEMESTER	VIII. Semester		
Course Code	**Course Name**	**Credits /ECTS**	**Prerequisite**
EE 402	Engineering Design II	4 / 5	
TE 4..	Technical Electives	3 / 5	
TE 4..	Technical Electives	3 / 5	
TE 4..	Technical Electives	3 / 5	
TE 4..	Technical Electives	3 / 5	
		16/ **25**	

* 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**
EE469	Electromagnetic Wave Propagation and Antennas	3	EE346
EE411	Telecommunications	3	EE346
EE412	Radar Systems	3	ECC 008, MTH251
EE416	Computer Networking	3	ECC 008
EE430	Wireless and Personnel Communications Systems	3	EE346
EE461	Digital Signal Processing	3	ECC 008
ECC419	Image Processing	3	ECC 008
EE425	Satellite Communication Systems	3	EE346
EE427	Information Theory and Coding	3	ECC 008, MTH 251
EE428	Communication Electronics	3	EE346
EE429	Mobile Communication Systems	3	EE346
EE469	Electromagnetic Wave Propagation and Antennas	3	EE346
	Control Major		
ECC404	Neural Networks	3	EE210
EE424	Process Control Instrumentation Technology	3	EE324
EE435	Mechatronics	3	EE324
EE451	Digital Electronics	3	ECC 001
EE454	Digital Control Systems	3	EE324
EE457	Robotic 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
EE472	Power System Analysis II	3	EE471
EE473	Power System Protection	3	EE471
EE474	Static Power Conversion	3	EE433
EE475	High Voltage Techniques I	3	*
EE476	High Voltage Techniques II	3	EE476
EE478	Distribution System Techniques	3	EE471
EE492	Illumination Engineering	3	EE331

* 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 Electrical & Electronic Engineering Department together with the objective of each module.

FIRST YEAR

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.

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.

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.

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.

TDE 102 Technical Drawing and Electrical Applications, 3 Credits, 5 ECTS

Course Description:

Working with CAD and creating 2D manufacturing drawings, screw threads and threaded fasteners, keys and keyways, limits and fits and their applications to mass production, economics of Limits and Fits, geometrical tolerances and applications, gears and shafts, spring and spring calculations, brief introduction to 3D.

EE 100 Introduction to Electrical Engineering, 1 Credits, 3 ECTS

Objectives of the Course:

To provide the students with the essential knowledge of elements of electrical engineering and prepare him for the next steps in his study.To prepare students for different notions of electrical engineering To provide basic understanding of electric circuits and their analysis.

Course Description:

This course aims to introduce basic notions of electrical engineering for the students of the first year of electrical engineering. The basic formulas of electrical engineering and definitions of the electrical current and voltage. The differences between DC and AC signals are also introduced in this course. It offers the student an opportunity to have basic idea about concepts of electrical engineering and prepares him for higher level courses.

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.

EE 210 Computer Applications 3 Credits, 6 ECTS

Objectives of the Course:

Provide the students with a basic knowledge of MATLAB as a programming and simulation environment. Provide students with tools of problems analysis and solving using MATLAB

Provide students with basic understanding of simulation and electrical systems representation

Course Description

This course provides the students with the important tools for programming using MATLAB environment, it covers the basic concepts of programming in MATLAB using repetitive and conditional structures, the operations of vectors and matrices in MATLAB. The Solution of different numerical analysis problems using MATLAB. The design of User interfaces and communication abilities of MATLAB. An introduction of simulation of different electrical power and control systems. The use of multisim as an electronic simulation tool.

EE 241 Electrical Materials, 3 Credits, 4 ECTS

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

Course Description

The course covers followings; introduction to quantum mechanics; crystal structures, energy levels in crystals; quantum physics of metals, electron transport in metals; semiconductors; impurities; carrier transport in semiconductors; generation and recombination of minority carriers, the p-n junction diode, light sensitive materials; photodiodes; light-emitting diodes, the bipolar junction and field effect transistors and characteristics of dielectric materials and devices; magnetic fields and characteristics of magnetic materials.

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.

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 equations

EE 202 Circuit Theory II, 4 Credits, 5 ECTS

Objectives of the Course:

Continues to introduce students the fundamentals of circuit theory

Course Description

The sinusoidal steady-state analysis; the phasor, the passive circuit elements in frequency domain. Phasor diagrams. Circuit Analysis Methods Instantaneous power. Average power. The effective (RMS) value. Apparent power and power factor. Complex power and power factor correction. Polyphase circuits. Circuit analysis in the s-domain. Magnetically coupled circuits. Two-port networks.

EE 216 Electromagnetic Theory, 3 Credits, 5 ECTS

Objectives of the Course:

- To provide a student with the necessary tools for the critical evaluation of existing and future electromagnetic phenomena
- To teach the concepts and principles of constructions of electromagnetics

To enable a student to evaluate and choose a electromagnetic tools to match the problem

Course Description

Electromagnetic Spectrum, Vector Analysis, Coordinate Systems, Force Between the Point Sources, Coulomb Law , Electric Field Strength (E), Electric Field of Several Point Charges, Charge Distribution, Charge Density, Continuous Charge Distribution, Electric Scalar Potential (V), Electric Field Lines, Equpotential Countours, Field Lines, Electric Potential of Charge Distribution, The Electric Feild as the Gradient of the Electric Potential, Electric Flux, Electric Flux Through Closed Surface, Charged One Shell, Capasitors and Capasitance, Moving Particles in the Electric Field, Dielectrics, Permittivite,Electric Dipol, Electric Dipol Moment, Polarization, Boundary Conditions, Boundary of Two Dielectrics Capacitors with Dielectrics, Energy of the Capacitor, Diverjans Theorem, Laplacien Operator, Poisson Equation, Laplace Equation, Static Magnetic Fields of Stable Electric Currents, Force on the Wire that is Carrying Currents Inside the Magnetic Fields, Magnetik Field of Current Carrying Element (Biot Savart Law), Force Between the Two Linear Parallel Conductors , Magnetic Flux, Magnetic Flux Density, Magnetic Flux Through Closed Surface (Gauss Law), Torq on the Ring, Magnetic Moment, Solenoid Inductance, Inductances of Simple Geometries, Ampere Law and H, Amper Law Applied to Conductive Medium and Maxwell Equation, Conductors and Charged Particles Moving Inside the Static Magnetic Fields, Rotary Motor, Magnetic Leviation (Maglev), Hall-Effect Generator, Moving Conductor Inside the Static Magnetic Field, Electric and Magnetic Fields Changing with Time, Conductors Moving Inside the Magnetic Field, General Situation of the Induction.

EE 220 Electrical Measurements, 3 Credits, 5 ECTS

Objectives of the Course: The students will be familiar with various measuring instruments used to detect electrical quantities.

Course Description

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

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.

MTH 241 Complex Calculus, 3 Credits, 5 ECTS

Course Description

Complex numbers. Rectangular and Polar forms. Analytic functions. Elementary functions. Integrals. series. Residues and poles. Mapping and elementary functions

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.

EE 321 Electronics II, 4 Credits, 6 ECTS

Objectives of the Course:

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

Course Description

This course is designed for electrical & electronics engineering undergraduate students. The purpose of this course is to provide amplifier and instrumentation background on technical aspects. Field effect transistors, Multi stage amplifiers, Methods of coupling, Differential amplifiers, Operational amplifiers, Summing amplifiers, Integrators, Differentiators, Voltage Comporators, Instrumentation amplifiers, Oscillators, Active Filters.

EE 331 Electromechanical Energy Conversion I, 4 Credits, 5 ECTS

Objectives of the Course:

Introduces students to the fundamentals of electrical machinery

Course Description

Electromagnetic circuits; properties of ferromagnetic materials. Single-phase and three-phase transformers. Short and open circuit tests, Equivalent circuits of the transformers, Efficiency, Per Unit System. Principles of electromechanical energy conversion:. DC machines: Theory, generators, motors, speed control

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

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.

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.

EE 324 Linear Control Systems, 4 Credits, 5 ECTS

Course Description

Develop a thorough understanding on basic of modern control systems engineering such as the fundamental concepts of a Control System, Laplace transfer to find input-output relationship of control systems. The mathematical modelling of the electrical, liquid-level and mechanical systems, transfer functions and block diagram of control systems, analysis of stability and errors of a control system.

EE 346 Communication Systems, 4 Credits, 6 ECTS

Objectives of the Course:

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

Course Description

Topics include Fourier representation of signals and systems, amplitude modulation, angle modulation, random signals and noise, and noise in analog communications

MTH 323 Numerical Analysis, 3 Credits, 6 ECTS

Objectives of the Course:

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

Course Description:

Taylor Series Approximations. Numerical Differentiation. Propagation of Errors. Bisection Method. The False Position Method. Simple One-Point Iteration. Newton-Raphson Method. Secant Method. Newton Raphson Method for Nonlinear Equations. LU Crout Decomposition. Gauss-Seidel Method. Optimization. Newton's Method. Multivariate Unconstrained Optimization. Steepest Ascent Method. Constrained Optimization. Linear Programming. The Simplex Method. Linear Regression. Least Squares. Newton's Interpolating Polynomials. Lagrange Interpolating Polynomials. Newton Cotes Integration Formula. Trapezoidal Rules. Simpson Rules. Euler's Method. Heun's Method

EE 332 Electromechanical Energy Conversion II, 4 Credits, 5 ECTS

Objectives of the Course:

Continues to introduce students the fundamentals of electrical machinery

Course Description:

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

FOURTH YEAR

EE 401 Engineering Design-I, 4 Credits, 5 ECTS

Objectives of the Course:

- To provide design experience to the students through individual and teamwork and familiarize them with the project management methodology
- To provide the ability to understand and redefine a given engineering problem, and the ability to develop a conceptual design
- To provide students the ability to communicate effectively

Course description:

This course is organizedto provide the fundamentals of project design, presentation and management. Also engineering economics, ethics and design experience through an engineering project is provided through the course.

EE 402 Engineering Design-II, 4 Credits, 5 ECTS

Objectives of the Course:

- To provide design experience to the students through individual and teamwork and improve their knowledge on the project management methodology.
- To provide students with the experience of realization of a product from conceptual design to working model
- To provide students the ability to communicate effectively

Course description:

This course is a continuation of EE401 Engineering Design I with topics covering completion of an engineering project with a final report, oral presentation to a jury and poster presentation at an "Engineering Day" event.

EE 411 Telecommunications, 3 Credits, 5 ECTS

Objectives of the Course:

- To explain analog to digital conversion
- To explain the details of digital transmission and reception
- To teach the basics of effects of noise on digital communications To describe various applications of digital communications

Course description:

Topics include pulse modulation, baseband data transmission, digital bandpass modulation techniques, random signals and noise, and noise in digital communications

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 416 Computer Networking, 3 Credits, 5 ECTS

Objectives of the Course:

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

Course description:

This course is to provide students with an overview of the concepts and fundamentals of data communication and computer networks. Topics to be covered include: data communication concepts and techniques in a layered network architecture, communications switching and routing, types of communication, network congestion, network topologies, network configuration and management, network model components, layered network models (OSI reference model, TCP/IP networking architecture) and their protocols, various types of networks (LAN, MAN, WAN and Wireless networks) and their protocols.

EE 425 Satellite Communication Systems, 3 Credits, 5 ECTS

Objectives of the Course:

This course covers the basic techniques for the design and analysis of satellite communication systems.

Course description:

Topics include orbits and trajectories, characteristics of satellites, frequency spectrum allocations, flexibility, reliability and quality issues, transmitting and receiving stations, link budget analysis, modulation and multiple access, transmission distortion and impairments.

EE 427 Information Theory and Coding, 3 Credits, 5 ECTS

Objectives of the Course:

- To provide students a basic understanding of entropy and information
- To teach students basics of coding theory
- To give an inside into the fundamentals and applications of modern error-correcting codes

Course description:

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

EE 428 Communication Electronics, 3 Credits, 5 ECTS

Course description:

Analog communication circuits: amplifiers, filters, oscillators, VCO, PLL circuits. Digital communication circuits: encoders, decoders. Modulators and demodulators.

EE 429 Mobile Communication Systems, 3 Credits, 5 ECTS

Course description:

Introduction to cellular mobile systems; Elements of cellular radio system design; Specifications ofAnalog Systems; Cell coverage and propagation; Cochannel interference; Frequency managementand channel assignment; Hand-offs and Dropped calls; Switching and Traffic; System evaluations;Digital cellular systems; Intelligent cell and intelligent network.

EE 430 Wireless and Personnel Communications Systems, 3 Credits, 5 ECTS

Course description:

Cellular communication concepts. Roaming. Cells splitting. Access technology. Architecture ofmobile switching center. Mobile and base stations call processing. Authentication. Encryption andinformation security in mobile systems. North American, Japanese and European cellular systems.Iridium-66 and globstar-48 systems.

EE 461 Digital Signal Processing, 3 Credits, 5 ECTS

Objectives of the Course:

Introduces students to the fundamentals of Digital Signal Processing

Course Description:

Discrete-time signals and systems. Realization of discrete-time systems. Analog I/O interface for real time DSP systems. Discrete transforms. FIR and IIR filters. Synthesis of filters.

ECC 419 Image Processing, 3 Credits, 5 ECTS

Objectives of the Course:

Teaching the basics of image processing; To illustrate the basic applications of image processing using Matlab. To give the principles of image enhancement approaches

Course Description:

Discrete-time signals and systems. Realization of discrete-time systems. Discrete Fourier transform. FIR and IIR filters. Cyclic limit. Synthesis of filters. Bilateral transform. Windowing. Image processing techniques. Image recognition. Noise sensitivity and scaling. Edge detection.

EE 469 Electromagnetic Wave Propagation and Antennas, 3 Credits, 5 ECTS

Course description:

Maxwell’s equations and coordinate systems. Wave equations. Green’s functions, radiation. Ideal dipole. Doppler effect. Basic antenna performance parameters. Line sources and wire antenna. Broadband antenna. Array theory. Aperture theory. Frequency independent antennas. Antenna measurements.

ECC 404 Neural Networks, 3 Credits, 5 ECTS

Objectives of the Course:

Teaching the basics of neural networks. To illustrate the basic applications of neural networks using Matlab. To give the principles of neural networks approaches

Course Description

The Neural network paradigm and fundamentals. Training by error minimization. Back propagation algorithm. Feedback and recurrent networks. Hopfield network, Genetic algorithms. Probability and neural networks. Optimizations and constraint. Introduction to Neural Networks, Supervised/Unsupervised learning algorithm, Introduction to back propagation algorrithm, Applications of back propagation algorithm, XOR problem, Introduction to adaline, Practical application of adaline, Application of hopfield algorithm.

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 435 Mechatronics, 3 Credits, 5 ECTS

Course description:

Introduction to Mechatronics and measurement systems. Sensors and transducers: Sensors andtransducers, Performance terminology, Examples of sensors, Selection of sensors. Signal conditioning: Signal conditioning, The operational amplifiers for analog signal processing,Protection, Filtering, Digital circuits and systems. Measurement systems: Designing measurementsystems, Data presentation systems, Measurement systems, Testing and calibration. Mechanicalactuation systems: Mechanical systems, Kinematic chains, Cams, Gear trains, Ratchet mechanisms,Belt and chain drives. Electrical actuation systems: Electrical systems, Switches, Solenoids, Motors,Stepping motors. Basic system models: Mathematical models, Mechanical system building blocks,Electrical system building blocks, Fluid system building blocks, Thermal system building blocks.Simulation of simple mechanical systems by electrical elements (circuits). Design andmechatronics: Designing, Mechanisms, Examples of designs.

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

EE 476 High Voltage Techniques II, 3 Credits, 5 ECTS

Objectives of the Course:

- To give the basic information on internal and external over-voltages developed on the power system.
- To teach High A.C ,DC and Impulse voltage generation techniques
- To teach measurements of high voltages

Course Description

To give information on high voltage insulation tests required in practice

Insulation overvoltage-tests are studied . Topics include: generation of high, direct, alternating, and impulse voltages. Voltage multiplier circuits. Resistive, capacitive and mixed high-voltage dividers. Sphere gaps and high voltage measurement techniques.

EE 478 Distribution System Techniques, 3 Credits, 5 ECTS

Course description:

Basic considerations. Load characteristics and forecasting methods. Distribution substations. Operational characteristics of cables and transformers. System voltage regulation. Power factorcorrection. Fuse gear, switch gear, current and voltage transformers. Over current and thermalprotection. Earthing methods. Economics of distribution systems.

EE 492 Illumination Engineering, 3 Credits, 5 ECTS

Objectives of the Course:

Concepts of illumination engineering

Course Description

Basic concepts and laws of illumination, types of lamps, interior and external illumination calculations, installation calculations for cable cross sections and the voltage drop, calculating the circuit breaker values and designing the electrical board, symbols and planning.

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 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 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
CHM 101	General Chemistry	4	6	Compulsory	E
ECC 101	Computer Programming	3	5	Compulsory	E
ENG 101	English I	3	4	Compulsory	E
MTH 101	Calculus I	4	6	Compulsory	E
PHY 101	General Physics I	4	6	Compulsory	E
YİT 101	Turkish For Foreign students	2	3	Compulsory	S
AİT 101	Atatürk's Principles & Turkish Reforms	2	3	Compulsory	-
		20	30		

2 (2nd Semester)

Course Code	Course Name	CR	ECTS	Status	Grade
MTH113	Linear Algebra	3	6	Compulsory	BB
TDE 102	Tech. Drawing & Electrical App.	3	5	Compulsory	E
ENG 102	English II	3	6	Compulsory	DC
MTH 102	Calculus II	4	6	Compulsory	E
PHY 102	General Physics II	4	6	Compulsory	E
EE 100	Introduction to Electrical Engineering	1	3	Compulsory	E
		18	32		

3 (3rd Semester)

Course Code	Course Name	CR	ECTS	Status	Grade
ECC 216	Circuit Theory I	4	5	Compulsory	E
EE 210	Computer Applications	3	6	Compulsory	BA
EE 241	Electrical Materials	3	4	Compulsory	CC
ENG 201	English Communication Skills	3	6	Compulsory	DC
MTH 201	Differential Equations	4	6	Compulsory	E
FRE 101	French Language	3	6	Elective	AA
		17	33		

4 (4th Semester)

Course Code	Course Name	CR	ECTS	Status	Grade
EE 202	Circuit Theory II	4	5	Compulsory	E
EE 216	Electromagnetic Theory	3	5	Compulsory	E
EE 220	Electrical Measurements	3	5	Compulsory	E
ECC 218	Electronics I	4	6	Compulsory	E
MTH 241	Complex Calculus	3	5	Compulsory	DC
EE 200	Summer Training I	-	4	Compulsory	S
		20	30		

5 (5th Semester)

Course Code	Course Name	CR	ECTS	Status	Grade
ECC 001	Logic Circuit Design	3	5	Compulsory	E
EE 321	Electronics II	4	6	Compulsory	E
EE 331	Electromechanical Energy Conv I	4	5	Compulsory	BA
ECC 008	Signals And Systems	4	7	Compulsory	E
MTH 251	Probability And Random Variables	3	6	Compulsory	E
		18	29		

6 (6th Semester)

Course Code	Course Name	CR	ECTS	Status	Grade
ECC 301	Microprocessors	4	6	Compulsory	E
EE 324	Linear Control Systems	3	5	Compulsory	E
EE 346	Communication Systems	4	6	Compulsory	E
MTH 323	Numerical Analysis	3	6	Compulsory	E
EE 332	Electromechanical Energy Conv II	3	5	Compulsory	AA
EE 300	Summer Training II	-	4	Compulsory	S
		17	32		

7 (7th Semester)

Course Code	Course Name	CR	ECTS	Status	Grade
ECC 404	Neural Networks	3	5	Elective	CC
ECC 426	Engineering Economy	3	4	Compulsory	E
EE 475	High Voltage Techniques I	3	5	Elective	CB
EE 427	İnfotmation Theory And Coding Theory	3	5	Elective	CB
EE 437	Cryptography And Coding Theory	3	5	Elective	BB
EE 401	Engineering Design-I	4	5	Compulsory	BB
		19	29		

8 (8th Semester)

Course Code	Course Name	CR	ECTS	Status	Grade
EE 402	Engineering Design-II	4	5	Compulsory	AA
EE 471	Power Systems Analysis I	3	5	Elective	CC
EE 461	Digital Signal Processing	3	5	Elective	E
EE 469	Electromag.Wave Propag & Antennas	3	5	Elective	E
EE 463	Image Processing	3	5	Elective	BA
		16	25		

TOTAL CREDITS 145 - 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 (Yükseköğretim Planlama, Denetleme, Akreditasyon ve Koordinasyon Kurulu – YÖDAK). Established in 1988, the Council regulates the activities of higher education institutions with respect to research, governing, planning and organization. The higher education institutions are established within the framework of the Higher Education Law. All programs of higher education should be accredited by YÖDAK.

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