

*Modern Future Organization for Science and Technology  
Higher Institute for Engineering and Technology  
In New Damietta*

*Internal Regulations*

*for*

*Higher Institute for Engineering and  
Technology in New Damietta*



## **9. PROGRAMS SPECIFICATIONS**

*Ministry of higher education  
Higher Institute for Engineering and Technology  
In New Damietta*



## *A. Chemical Engineering*



## **Chemical Engineering**

### **Introduction**

Chemical Engineering deals with the technology of using chemical and physical processes to convert naturally-occurring raw materials into final physical products. By combining the art of industrial technology with modern concepts of science and Engineering, it is possible to bring about the realization of processes developed in the laboratory for the production of industrial products and consumer goods.

The program is designed to educate the student in the basic fundamentals of Chemical Engineering and train him in research and development. The curriculum contains a number of elective and specialized topics such as petroleum refining, petrochemicals, desalination, natural gas engineering, corrosion and polymerization.

The program is supported by seven well-equipped laboratories in the areas of process measurement and control, heat transfer, fluid mechanics, organic chemistry, physical chemistry, analytical chemistry, process simulation. These laboratories are designed to familiarize students with aspects of theoretical and practical fundamentals and introduce them to the atmosphere of industrial operations.

The department offers the chemical engineering student a traditional program as well as concentrations in **material engineering and petroleum engineering**. The required courses for each concentration are listed under its curriculum.

### **Vision and Mission**

**Vision:** The Chemical Engineering Program strives for regional and international recognition in teaching, research and community service. It enriches the standard of engineering education, continually enhances the quality and competence of graduated students, and stimulates outstanding research activities that contribute to the advancement of the chemical engineering profession and the development of local and regional industry.

**Mission:** The Chemical Engineering Program produces chemical engineers capable of meeting the technological and societal needs of Damietta government, Egypt and the Arab region. This mission is fulfilled by providing a broad curriculum in the basic sciences, process systems and design, unit operations, and in modern experimental and computing techniques. The program strives for



academic excellence through continual assessment of the outcomes. The focus is on petroleum and petrochemical technology, environmental engineering, and water technology, material (foams, ceramics, rubber, plastics, painting and paper) technologies and industries.

## **Programme Specification**

### **A- Basic Information**

- 1- Programme title: **Chemical Engineering**
- 2- Programme type: **Single**      Double      Multiple
- 3- Department (s): Chemical Engineering Dept
- 4- Coordinator: .....
- 5- External evaluator(s) .....
- 6- Last date of programme specifications approval: .....

### **B- Professional Information**

#### **1- Program aims**

##### **For the Society:**

- Fulfill the needs of the public and private sectors for chemical engineers, who are capable in their field and professionally qualified, by a thorough instruction in engineering sciences and design.
- Provide a broad education necessary for responsible citizenship, including an understanding of ethical and professional responsibility, and the impact of engineering solutions on the society and the environment.

To provide an attractive avenue for students interested in Chemical engineering which:

- Provides a sound education in Chemical Engineering fundamentals and related topics.
- Trains students such as they can design, analyze, and operate manufacturing processes involving physical and chemical changes.



- Trains students such as they can design and operate chemical processes satisfying social, environmental, and economical constraints.
- Prepares students for careers in the Chemical and related Industry within the Damietta region and beyond.
- Prepares students for practical engineering applications, as well as providing the depth of knowledge required for graduate studies.
- Motivates graduates' participation in life-long learning and professional development activities

## **2- Intended Learning Outcomes (ILOs)**

Engineering Programs must demonstrate that their graduates have acquired certain skills and have proficiency in a number of technical areas. According to ABET Engineering Criteria 2000, Engineering Program must demonstrate that their graduates have the attributes collectively referred to as the **Attributes of an Engineer**.

Consequently, the Chemical Engineering Program aims to graduate Chemical Engineers with a knowledge/understanding of:

1. Application of Mathematics, Science & Engineering Principles.
2. Experimental Design and Experimental Data Collection and Analysis
3. Engineering Design (Chemical Systems, Units & Processes)
4. Multidisciplinary Team Work
5. Identification, Formulation & Solution of Engineering Problems
6. Professional and Ethical Responsibilities, including Safety and Environmental aspects related to Chemical Systems, Units and Processes.
7. Effective Communication Skills
8. Contemporary Issue & Global/Social Impact of Engineering Solutions.
9. Need and Ability to engage on Lifelong Learning
10. Modern Engineering Practice



11. Principles and Working Knowledge of subject areas as defined by the Program Criteria of the American Institute of Chemical Engineers

### **3- Academic standards**

#### **3a External references for standards (Benchmarks)**

- ABET Engineering Criteria 2000
- Cleveland State University, Dept of Chemical Engineering
- University of Michigan, Chemical Engineering Dept.

#### **3b Comparison of provision to external references**

- **Program Outcomes** are according to those listed under Criterion 3 of ABET EC2000
- The courses and credits are matched with these in the different Chemical Engineering Departments of the listed universities

### **4- Curriculum Structure and Contents**

a. Program duration: 5 levels, ten semesters

b. Program structure

i- No. of contact hours per week: 30

Lectures: 17,            Lab: 6                    Exercise: 7

ii- No. of credit hours: 180

Compulsory: 162    Electives: 18

iii- No. of credit hours of basic sciences courses:

No. 35            % 19.5

iv- No. of credit hours of courses of social sciences and humanities

No. 13            % 7.5

v- No. of credit hours of specialized courses:

No. 88            % 49



vi- No. of credit hours of other courses:

N0. 44      % 24

vii- Practical/Field Training:

2 times (each time at least 4 weeks, 30h/week) during 3 summers.

viii- Program Levels (in credit-hours system):

Level 1: 36              Level 2: 36              Level 3: 36

Level 4: 36              Level 5: 36

## 5- Program courses

### a. Compulsory: (162 CR)

#### 1. Basic science Courses: (35 CR)

Code	Course name	No of units	Hours per week			ILOs Covered	Prerequisite
			Lect	Lab	Exer		
MTH 101	Mathematics 1	3	2	-	2	1	-
MTH 102	Mathematics 2	3	2	-	2	1	-
MTH 201	Mathematics 3	3	2	-	2	1	MTH 101
MTH 202	Mathematics 4	3	2	-	2	1	MTH 101
MTH 302	Numerical Methods in Engineering	3	2	-	2	1, 5	-
MTH 301	Engineering Probability and Statistics	3	2	-	2	1,5	-
ENG 101	Mechanics 1	3	2	-	2	1,5	-
ENG 102	Mechanics 2	3	2	-	2	1,5	-
PHY 101	Physics 1	4	2	2	2	1,2	-
PHY 102	Physics 2	4	2	2	2	1,2	-
CHE 101	General Chemistry	3	2	2	-	1,2	-
Total		35	22	6	20		





## 2. Engineering Courses: (78 CR)

Code	Course name	No of units	Hours per week			ILOs Covered	Pre-requisite
			Lect	Lab	Exer		
ENG 103	Engineering drawing and projection	3	1	4	-	1,5,11	-
ENG 104	Int. to computer systems	2	2	2	-	1,5,10,11	-
ENG 106	Int. to Eng. and environment	2	2	-	-	6,7,8	-
ENG 201	Computer programming	3	3	2	-	6,7,8	-
ENG 202	Engineering Thermodynamics	3	2	-	2	1,5,11	ENG 102
ENG 204	Electrical Engineering Fundamentals	4	3	-	2	1,5,11	-
ENG 205	Strength of materials	3	3		2	1,5,11	-
CHE 201	Chemical Engineering Principles I	3	2	-	2	1,3,5,6,11	CHE 101
CHE 202	Organic chemistry	4	3	2	-	1,5,11	CHE 101
CHE 203	Inorganic chemistry	3	3	2	-	1,5,11	CHE 101
ENG 301	Fluid Mechanics	3	2	1	1	1,3,5	ENG 102
ENG 302	Principles of Engineering Design	3	2	-	2	1,5,11	Comp. of 72 CR
CHE 301	Physical Chemistry	3	3	2	-	1	CHE 101
CHE 302	Material science and metallurgy	3	3	-	2	1,5	ENG 205
CHE 303	Chemical Engineering Principles II	3	3	-	2	1,3,5,6,11	CHE 201
CHE 304	Chemical Engineering Thermodynamics	3	3	2	-	1,5,11	-
CHE 305	Analytical Chemistry	3	3	2	-	1	CHE 101
CHE 306	Process Dynamics and Control	3	2	2	-	1,2,3,5,6,7,11	-
CHE 401	Reactor Design	4	3	-	2	1,2,3,5,11	CHE 304
CHE 402	Heat transfer	3	3	2	-	1,5,11	ENG 202
CHE 403	Mass Transfer	3	3	-	2	1,5,11	ENG 202
CHE 404	Corrosion Engineering	2	2	-	2	1,5,11	CHE 303
CHE 405	Mass Transfer Operations	3	3	-	2	1,3,5,11	CHE 403
CHE 501	Computer Applications	3	3	2	-	1,3,5,11	-
CHE 502	Petrochemical Engineering	3	3	-	2	1,5,11	CHE 101
CHE 504	Plant Design	3	3	-	2	1,3,5,6	CHE 401
Total		78	68	25	27		



### 3. Technological Courses (36 CR)

Code	Course name	No of units	Hours per week			ILOs Covered	Prerequisite
			Lect	Lab	Exer		
ENG 105	Production engineering	4	3	2	-	1,5,7,11	-
ENG 206	Int. to Information Technology	3	2	-	2	1,5,7,11	-
ENG 207	Technical report writing	2	2	2	-	7,10	-
ENG 308	Operations Research	3	2	-	2	1,2,3,5,7,11	MTH 302
CHE 406	Bio organic chemistry	3	3	-	2	1,3,5,7,10,11	CHE 203
CHE 407	Mechanical unit operation	3	3	-	2	1, 5, 11	CHE 304
CHE 408	Process Modeling and Simulation	3	3	2	-	1,5,11	MTH 302
CHE 503	Industrial Technology in Chem. Engineering	3	3	-	2	1,2,3,5,7,11	-
CHE 505	Petroleum Refining Engineering	3	3	-	2	1,2,3,5,7,11	-
ENG 415	Quality Assurance and Engineering Reliability	3	2	-	2	1,2,3,5,7,11	-
CHE 509	Project 1*	3	2	2	-	1,2,3,5,6,7,11	Comp. of 144CR
CHE 510	Project 2*	3	2	4	-	1,2,3,5,6,7,11	CHE 509
Total		36	30	12	14		

### 4. Humanities and Languages: (13 CR)

Code	Course name	No of units	Hours per week			ILOs Covered	Prerequisite
			Lect	Lab	Exer		
LNG 101	Technical English Language 1	2	2	2	-	6,7,8,9	-
LNG 201	Technical English Language 2	2	2	2	-	6,7,8,9	LNG 101
ENG 303	Engineering Economy	3	2	-	2	1,8,11	-
ENG 401	Environmental management	3	3	-	-	1,8,10	-
ENG 408	Project Management and Control	3	2	-	2	1,8,11	-
Total		13	11	4	4		



## **b. Chemical engineering technical electives (18 CR)**

The department offers the chemical engineering student a **Major traditional program** as well as concentrations in minor programs as:

- **Material engineering**
- **Petroleum and petrochemical engineering**

The required courses for each concentration are listed under its curriculum. Recommended technical electives for the options and concentrations are listed below.

### **1. Major (Traditional) chemical engineering: (18 CR)**

The Student chooses 6 courses form the following list

Code	Course name	No of units	Hours per week			ILOs Covered	Prerequisite
			Lect	Lab	Exer		
CHE 411	Liquefied Natural Gas	3	2	-	2	1,3,5,7,10,11	CHE 304
CHE 412	Air Pollution	3	2	-	2	1,6,8,10	Comp of 100 CH
CHE 414	Polymer Engineering	3	2	-	2	1,5,11	CHE 101
CHE 416	Water Desalination	3	2	-	2	1,2,3,5,7,11	CHM 402
CHE 417	Polymer Processing	3	2	-	2	1,2,3,5,7,11	CHE 305
CHE 516	Wastewater Treatment	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 520	Industrial Safety	3	2	-	2	1,6,8,10	Comp of 140 CH
CHE 521	Plasticizers	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 524	Food Processing Technology	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 526	Special Topics in Chemical Engineering	3	2	-	2		Comp of 140 CH

### **2. Material engineering Concentration**

The engineered materials concentration allows the student to develop a specialization in a particular area. The concentration begins with the survey course

**CHE 302 Material Science and metallurgy,**



which is required for all Chemical Engineering juniors, and is followed by 6 additional courses (18 Cr) which concentrates on the material technology and industry. The six courses for the concentration satisfy the technical and Chemical Engineering elective requirements in the curriculum.

Code	Course name	No of units	Hours per week			ILOs Covered	Prerequisite
			Lect	Lab	Exer		
CHE 414	Polymer Engineering	3	2	-	2	1,5,11	CHE 101
CHE 415	Engineering Material Selection	3	2	-	2	1,5,11	CHE 302
CHE 511	Electroplating	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 512	Ceramics	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 513	Refractories	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 514	Printing	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 515	Paints technology	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 517	Synthetic fibers	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 519	Paper Technology	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 521	Plasticizers	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 522	Foams	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 523	Rubber	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 526	Special Topics in Chemical Engineering	3	2	-	2		Comp of 140 CH

### **3. Petroleum and petrochemical engineering Concentration**

The petroleum engineering concentration allows the student to develop a specialization in a particular area. As well as the courses

**CHE 502 Petrochemical Engineering and  
CHE 505 Petroleum Refining Engineering,**

which are required for all Chemical Engineering graduates, the concentration contains 6 additional courses (18 Cr) which concentrate on the petroleum engineering and petrochemical industry. The 6 courses for the concentration satisfy the technical and Chemical Engineering elective requirements in the curriculum.



Code	Course name	No of units	Hours per week			ILOs Covered	Prerequisite
			Lect	Lab	Exer		
CHE 411	Liquefied Natural Gas	3	2	-	2	1,3,5,7,10,11	CHE 304
CHE 413	Gas Engineering	3	2	-	2	1,5,11	CHE 304, CHE 403
CHE 518	Gas Sweetening	3	2	-	2	1,3,5,7,10,11	CHE 201, CHE 403
CHE 521	Plasticizers	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 522	Foams	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 523	Rubber	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 525	Introduction to Combustion Phenomena	3	2	-	2	1,3,5,7,10,11	Comp of 140 CH
CHE 526	Special Topics in Chemical Engineering	3	2	-	2		Comp of 140 CH



## Suggested Course Distribution of Majoring in Chemical Engineering

### Level 1, Semester 1

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
MTH 101	Mathematics 1	3	2	-	2
ENG 101	Mechanics 1	3	2	-	2
PHY 101	Physics 1	4	2	2	2
CHE 101	General Chemistry	3	2	2	-
ENG 103	Engineering drawing and projection	3	1	4	-
ENG 104	Int. to computer systems	2	2	2	-
Total		18	11	10	6

## Chemical Engineering

### Level 1, Semester 2

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
MTH 102	Mathematics 2	3	2	-	2
ENG 102	Mechanics 2	3	2	-	2
PHY 102	Physics 2	4	2	2	2
ENG 105	Production engineering	4	3	2	-
ENG 106	Introduction to Engineering	2	2	-	-
LNG 101	Technical English Language 1	2	2	2	-
Total		18	13	6	6



## Chemical Engineering

### Level 2, Semester 1

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
MTH 201	Mathematics 3	3	2	-	2
CHE 201	Chemical Engineering Principles I	3	2	-	2
ENG 201	Computer programming	3	2	2	-
ENG 202	Engineering Thermodynamics	3	2	-	2
ENG 204	Electrical Engineering Fundamentals	4	3	-	2
LNG 201	Technical English Language 2	2	2	2	-
Total		18	13	4	8

## Chemical Engineering

### Level 2, Semester 2

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
MTH 202	Mathematics 4	3	2	-	2
CHE 202	Organic Chemistry	4	3	2	-
CHE 203	Inorganic Chemistry	3	3	2	-
ENG 205	Strength of materials	3	3	-	2
ENG 206	Int. to Information Technology	3	2	-	2
ENG 207	Technical report writing	2	2	2	-
Total		18	12	6	6



## Chemical Engineering

### Level 3, Semester 1

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
MTH 301	Engineering Probability and Statistics	3	2	-	2
CHE 301	Physical Chemistry	3	3	2	-
CHE 302	Material science and metallurgy	3	3	-	2
ENG 301	Fluid Mechanics	3	2	1	1
ENG 302	Principles of Engineering Design	3	2	-	2
ENG 303	Engineering Economy	3	2	-	2
Total		18	14	3	9

## Chemical Engineering

### Level 3, Semester 2

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
MTH 302	Numerical Methods in Engineering	3	2	-	2
CHE 303	Chemical Engineering Principles II	3	3	-	2
CHE 304	Chemical Engineering Thermodynamics	3	3	2	-
CHE 305	Analytical Chemistry	3	3	2	-
CHE 306	Process Dynamics and Control	3	2	-	2
ENG 308	Operations Research	3	2	-	2
Total		18	15	4	8





## Chemical Engineering

### Level 4, Semester 1

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
CHE 401	Reactor Design	4	3	-	2
CHE 402	Heat transfer	3	3	2	-
CHE 403	Mass Transfer	3	3	-	2
CHE 404	Corrosion engineering	2	2	-	2
ENG 408	Project Management and Control	3	2	-	2
Total		15	13	2	8

#### b. Elective

The student selects one course from the electives list (3 Credit hours)

## Chemical Engineering

### Level 4, Semester 2

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
CHE 405	Mass Transfer Operations	3	3	-	2
CHE 406	Bio organic chemistry	3	3	-	2
CHE 407	Mechanical unit operations	3	3	-	2
CHE 408	Process Modeling and Simulation	3	3	2	-
ENG 401	Environmental management	3	3	-	-
Total		15	15	2	6

#### b. Electives

The student selects ONE course from the electives list (3 Credit hours)



## Chemical Engineering

### Level 5, Semester 1

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
CHE 501	Computer Applications	3	3	2	-
CHE 502	Petrochemical Engineering	3	3	-	2
CHE 503	Industrial Technology in Chem. Eng.	3	3	2	-
CHE 509	Project 1*	3	2	2	-
Total		12	11	6	2

#### b. Electives

The student selects 2 courses from the electives list (6 Credit hours)

## Chemical Engineering

### Level 5, Semester 2

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
CHE 504	Plant Design	3	3	-	2
CHE 505	Petroleum Refining Engineering	3	3	-	2
ENG 415	Quality Assurance and Engineering Reliability	3	2	-	2
CHE 510	Project 2*	3	2	4	-
Total		12	10	4	6

\* Continuous Course; one oral examination for both CHE 509 and CHE 510 at the end of the second term

#### b. Electives

The student selects 2 courses from the electives list (6 Credit hours)

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# ***B. Communications and Electronics Engineering***

*Ministry of higher education  
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## Communications and Electronics Engineering

### Introduction

The Communication and Electronics Engineering Department is now very essential to take place in Damietta area due to the following:

1. The spread development of the different industries in Damietta area, and knowing that the electronics field takes a huge place in any type of industry now.
2. The huge development in the Communications around the world in general and in Egypt in special.

These make it necessary to produce leader engineers in the fields of communications and electronics who can address the challenges of the new century and excel at an international level.

**Electronic engineering** is a professional discipline that deals with the behavior and effects of electrons (as in electron tubes and transistors) and with electronic devices, systems, or equipment. The term now also covers a large part of electrical engineering degree courses as studied at most European universities. Its practitioners are called **electronics engineers** in Europe. In the Americas and some other parts of the world, the term electrical engineer is used to describe a person doing the same work. In many areas, electronic engineering is considered to be at the same level as electrical engineering, requiring that more general programmes be called **electrical and electronic engineering** (many UK universities have departments of **Electronic and Electrical Engineering**). Both define a broad field that encompasses many subfields including those that deal with power, instrumentation engineering, telecommunications, and semiconductor circuit design amongst many others.

The Bachelor of Science Program in Communication and Electronics Engineering has the following vision and mission. To satisfy these Mission and Vision and to meet the needs of its constituents, eight Educational Objectives have been adopted after studying ABET models of leading educational institutions. In addition, a set of Program Outcomes are developed.



## **Vision**

Electrical and Electronics Engineering Department will provide a program of the highest quality to produce leader engineers who can address the challenges of the new century and excel at an international level.

## **Mission**

With this vision, the mission of the Communication and Electronics Engineering Department is to provide its graduates with the knowledge and skills needed for high quality engineering work as well as advanced engineering research and to equip its graduates with a broad intellectual spectrum in order to prepare them for diverse and competitive career paths.

## **Programme Specification**

### **A- Basic Information**

- 1- Programme title: **Communications and Electronic Engineering**
- 2- Programme type: **Single**                      Double                      Multiple
- 3- Department (s): **Communications and Electronic Engineering Dept**
- 4- Coordinator: .....
- 5- External evaluator(s) .....
- 6- Last date of programme specifications approval: .....

### **B- Professional Information**

#### **1- Program aims**

##### **For the Society:**

- Fulfill the needs of the public and private sectors for Communications and Electronics engineering, who are capable in their field and professionally qualified, by a thorough instruction in engineering sciences and design.
- Provide a broad education necessary for responsible citizenship, including an understanding of ethical and professional responsibility, and the impact of engineering solutions on the society and the environment.



To provide an attractive avenue for students interested in Communication and Electronics engineering major which:

- Provides a sound education in communication and electronics engineering fundamentals and related topics.
- Trains students such as they can design, analyze, and operate manufacturing processes.
- Trains students such as they can design and operate the communication and electronics processes satisfying social, environmental, and economical constraints.
- Prepares students for careers in the communication and electronics and related Industry within the Damietta region and beyond.
- Prepares students for practical engineering applications, as well as providing the depth of knowledge required for graduate studies.
- Motivates graduates' participation in life-long learning and professional development activities

## **2- Intended learning outcomes (ILOs)**

Achievement of the following **Program Outcomes** would indicate that the graduates are equipped with the necessary knowledge and skills to achieve the Educational Objectives.

The first eleven **Program Outcomes** are similar to those listed under Criterion 3 of ABET EC2000.

1. Ability to apply knowledge of mathematics, science and engineering to model and solve communication and electronics engineering problems.
2. Ability to design and conduct experiments related to deterministic or stochastic systems, as well as to analyze and interpret data.
3. Ability to design processes and integrated systems that achieve system design objectives which typically include considerations of ergonomics, productivity, quality, and profitability.





4. Ability to work in multidisciplinary teams providing electrical engineering input, as well as leading and/or coordinating the team's project.
5. Ability to identify, formulate and solve communication and electronics engineering problems.
6. Ability to understand and appreciate professional conduct and ethical responsibility.
7. Ability to communicate effectively.
8. Ability to understand the impact of engineering solutions in a global and social context.
9. Ability to engage in life-long learning and appreciate the need for continual self-development.
10. Knowledge of contemporary issues.
11. Ability to use the techniques, skills, and the modern engineering tools necessary for communication and electronics engineering.
12. A competency to apply communication and electronics engineering techniques and tools in diverse types of organizations with focus on quality engineering and management, productivity and logistics, ergonomics and safety, and engineering economical decisions.

### **3- Academic standards**

#### 3a. External references for standards (Benchmarks)

1. ABET Engineering Criteria 2000
2. University of Nebraska-Lincoln, Dept of Electronics Engineering
3. Bilkent University, Dept of Electrical and Electronics Engineering

#### 3b. Comparison of provision to external references

- **Program Outcomes** are according to those listed under Criterion 3 of ABET EC2000
- The courses and credits are matched with these in the different Communications and Electronics Engineering Departments of the listed universities

### **4- Curriculum Structure and Contents**

- a. Programme duration 5 levels, ten semesters
- b. Programme structure



- i- No. of hours per week: 30  
Lectures: 17                      Lab: 6                      Exercise: 7
- ii- No. of credit hours: 180  
Compulsory: 162                      Elective: 18
- iii- No. of credit hours of basic sciences courses:  
No. 35                      % 19
- iv- No. of credit hours of courses of social sciences and humanities  
No. 13                      % 7
- v- No. of credit hours of specialized courses:  
No. 91                      % 51
- vi- No. of credit hours of other courses:  
NO. 41                      % 23
- vii- Practical/Field Training:  
3 times (4 weeks, 30h/week) during 3 summers.
- viii- Program Levels (in credit-hours system):  
Level 1: 36                      Level 2: 36                      Level 3: 36  
Level 4: 36                      Level 5: 36

## 5- Program courses

### b. Compulsory: (162 CR)

#### 1. Basic science Courses: (35 CR)

Code	Course name	No of units	Hours per week			ILOs Covered	Prerequisite
			Lect	Lab	Exer		
MTH 101	Mathematics 1	3	2	-	2	1	-
MTH 102	Mathematics 2	3	2	-	2	1	-
MTH 201	Mathematics 3	3	2	-	2	1	MTH 101
MTH 202	Mathematics 4	3	2	-	2	1	MTH 101
MTH 302	Numerical Methods in Engineering	3	2	-	2	1, 5	-
MTH 301	Engineering Probability and Statistics	3	2	-	2	1,5	-
ENG 101	Mechanics 1	3	2	-	2	1,5	-
ENG 102	Mechanics 2	3	2	-	2	1,5	-
PHY 101	Physics 1	4	2	2	2	1,2	-



PHY 102	Physics 2	4	2	2	2	1,2	-
CHE 101	General Chemistry	3	2	2	-	1,2	-
Total		35	22	6	20		

## 2. Engineering Courses: (78 CR)

Code	Course name	No of units	Hours per week			ILOs Covered	Prerequisite
			Lect	Lab	Exer		
ENG 103	Engineering drawing and projection	3	1	4	-	1,5,11	-
ENG 104	Int. to computer systems	2	2	2	-	1,5,10,11	-
ENG 106	Int. to Engineering & Environment	2	2	-	-	6,7,8	-
ENG 201	Computer programming	3	3	2	-	6,7,8	-
ENG 202	Engineering Thermodynamics	3	3	-	2	1,5,11	ENG 102
ENG 204	Electrical Engineering Fundamentals	4	3	-	2	1,5,11	-
CEE 201	Electronics 1	3	3	-	2	1,5,11	-
CEE 202	Electronics and electrical measurements	4	3	-	2	1,5,11	-
CEE 203	Electronic tests 1	2	1	3	-	1,2,5, 11	CEE 201
CEE 204	Electronics 2	4	4	-	2	1,5,11	CEE 201
CEE 301	Fundamentals of Electromagnetism	3	3	-	2	1,5,11	-
CEE 305	Electronic circuits 1	3	3	-	2	1,2,5, 11	CEE 201
CEE 306	Electronic tests 2	3	1	3	-	1,2,5, 11	CEE 203
ENG 301	Fluid Mechanics	3	2	1	1	1,3,5	ENG 102
ENG 304	Advanced Computer programming	3	2	2	-	1,5,11	ENG 201
ENG 305	Automatic control	3	2	-	2	1,5,11	-
ENG 307	Engineering Management	3	2	-	2	1,3,5,8, 11	-
CEE 401	Signal analysis	3	3	-	2	1,5,11	-
CEE 402	Electronic circuits 2	3	3	-	2	1,2,5, 11	CEE 305
CEE 403	Integrated circuits	3	3	-	2	1,2,5, 11	CEE 305
CEE 404	Electronic tests 3	3	1	3	-	1,2,5, 11	CEE 306
CEE 405	Optical semiconductors	3	3	-	2	1,5,11	CEE 202
CEE 406	Microprocessor systems	3	3	-	2	1,5,11	CEE 202
CEE 407	Electromagnetic waves	3	3	-	2	1,5,11	CEE 301



CEE 408	Electronic tests 4	3	1	3	-	1,2,5, 11	CEE 402
CEE 506	Electronic tests 5	3	1	3	-	1,2,5, 11	CEE 403
Total		78	61	26	31		

### 3. Technological Courses: (36 CR)

Code	Course name	No of units	Hours per week			ILOs Covered	Prerequisite
			Lect	Lab	Exer		
ENG 105	Production engineering	4	3	2	-	1,5,7,11	-
ENG 206	Int. to Information Technology	3	2	-	2	1,5,7,11	-
ENG 207	Technical report writing	2	2	2	-	7,10	-
CEE 302	Logical and digital circuits	3	3	-	2	1,5,11	CEE 204
ENG 306	Computer organization	3	3	-	2	1,5,7,11	-
CEE 501	Signal processing	3	3	-	2	1,5,11	CEE 401
CEE 502	Communication systems	3	3	-	2	1,5,11	CEE 402
CEE 503	Communications networks	3	3	-	2	1,5,11	CEE 402
CEE 504	Digital Communications	3	3	-	2	1,5,11	CEE 402
CEE 505	Luminous Communications	3	3	-	2	1,5,11	CEE 402
CEE 509	Project 1*	3	2	2	-	1,2,3,4,5,6,.....,14	Comp. of 144CR
CEE 510	Project 2 *	3	2	4	-	1,2,3,4,5,6,.....,14	CEE 509
Total		36	33	10	16		

### 4. Humanities and Languages: (13 CR)

Code	Course name	No of units	Hours per week			ILOs Covered	Prerequisite
			Lect	Lab	Exer		
LNG 101	Technical English Language 1	2	2	2	-	6,7,8,9	-
LNG 201	Technical English Language 2	2	2	2	-	6,7,8,9	LNG 101
ENG 303	Engineering Economy	3	2	-	2	1,8,11	-
ENG 401	Environmental management	3	3	-	-	1,8,10	-
ENG 408	Project Management and Control	3	2	-	2	1,8,11	-
Total		13	11	4	4		



**c. Elective**

**1. Technological courses: (18 CR)**

Code	Course name	No of units	Hours per week			ILOs Covered	Prerequisite
			Lect	Lab	Exer		
CEE 411	Microwave electronics	3	2	-	2	1,5,11	CEE 402
CEE 412	Advanced electronic measurements	3	2	-	2	1,5,11	CEE 202
CEE 413	Electronic design with aids of computer	3	2	-	2	1,5,11	CEE 204
CEE 414	Fundamentals of Biomedical Engineering	3	2	-	2	1,5,11	ENG 305
CEE 415	Information systems	3	2	-	2	1,5,11	ENG 205
CEE 416	Telecommunications	3	2	-	2	1,5,11	CEE 401
CEE 417	Computer Circuits Design	3	2	-	2	1,5,11	CEE 402
CEE 418	Artificial Intelligence	3	2	-	2	1,5,11	ENG 305
CEE 511	Robotics engineering	3	2	-	2	1,5,11	MTH 202
CEE 512	Computer Engineering	3	2	-	2	1,5,11	ENG 104
CEE 513	Radar Systems	3	2	-	2	1,5,11	CEE 416
CEE 514	Neural networks	3	2	-	2	1,5,11	ENG 305
CEE 515	Printed circuits design and fabrications	3	2	-	2	1,5,11	CEE 406
CEE 516	Industrial Electronics	3	2	-	2	1,5,11	CEE 204
CEE 517	Introduction to VLSI Design	3	2	-	2	1,5,11	CEE 402
CEE 518	Satellite systems	3	2	-	2	1,5,11	CEE 416
CEE 519	Mobile communications systems	3	2	-	2	1,5,11	CEE 416
CEE 520	Antenna and wave propagation	3	2	-	2	1,5,11	CEE 407
CEE 521	Advanced electronic systems	3	2	-	2	1,5,11	
CEE 522	Wireless Communications	3	2	-	2	1,5,11	CEE 416
CEE 523	Special Topics in communication Engineering	3	2	-	2	1,5,11	DEPT



## Suggested Course Distribution of Majoring in Communication and Electronics Engineering

### Level 1, Semester 1

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
MTH 101	Mathematics 1	3	2	-	2
ENG 101	Mechanics 1	3	2	-	2
PHY 101	Physics 1	4	2	2	2
CHE 101	General Chemistry	3	2	2	-
ENG 103	Engineering drawing and projection	3	1	4	-
ENG 104	Int. to computer systems	2	2	2	-
Total		18	11	10	6

## Communication and Electronics Engineering

### Level 1, Semester 2

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
MTH 102	Mathematics 2	3	2	-	2
ENG 102	Mechanics 2	3	2	-	2
PHY 102	Physics 2	4	2	2	2
ENG 105	Production engineering	4	3	2	-
ENG 106	Int. to Engineering and environment	2	2	-	-
LNG 101	Technical English Language 1	2	2	2	-
Total		18	13	6	6



## Communication and Electronics Engineering

### Level 2, Semester 1

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
MTH 201	Mathematics 3	3	2	-	2
CEE 201	Electronics 1	3	3	-	2
ENG 201	Computer programming	3	2	2	-
ENG 202	Engineering Thermodynamics	3	3	-	2
ENG 204	Electrical Engineering Fundamentals	4	3	-	2
LNG 201	Technical English Language 2	2	2	2	-
Total		18	15	4	8

## Communication and Electronics Engineering

### Level 2, Semester 2

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
MTH 202	Mathematics 4	3	2	-	2
CEE 202	Electronics and electrical measurements	4	3	-	2
CEE 203	Electronic tests 1	2	1	3	-
CEE 204	Electronics 2	4	4	-	2
ENG 206	Int. to Information Technology	3	2	-	2
ENG 207	Technical report writing	2	2	2	-
Total		18	14	5	8



## Communication and Electronics Engineering

### Level 3, Semester 1

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
MTH 301	Engineering Probability and Statistics	3	2	-	2
CEE 301	fundamentals of Electromagnetism	3	3	-	2
CEE 302	Logical and digital circuits	3	3	-	2
ENG 301	Fluid Mechanics	3	2	1	1
ENG 303	Engineering Economy	3	2	-	2
ENG 304	Advanced Computer programming	3	2	2	-
Total		18	14	3	9

## Communication and Electronics Engineering

### Level 3, Semester 2

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
MTH 302	Numerical Methods in Engineering	3	2	-	2
CEE 305	Electronics circuits 1	3	3	-	2
CEE 306	Electronic tests 2	3	1	3	-
ENG 305	Automatic control	3	3	-	2
ENG 306	Computer organization	3	3	-	2
ENG 307	Engineering Management	3	2	-	2
Total		18	14	3	10





## Communication and Electronics Engineering

### Level 4, Semester 1

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
CEE 401	Signal analysis	3	3	-	2
CEE 402	Electronic circuits 2	3	3	-	2
CEE 403	Integrated circuits	3	3	-	2
CEE 404	Electronic tests 3	3	1	3	-
ENG 408	Project Management and Control	3	2	-	2
Total		15	12	3	8

#### b. Elective

The student selects one course from the elective courses list (3 Credit hours)

## Communication and Electronics Engineering

### Level 4 Semester 2

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
CEE 405	Optical semiconductors	3	3	-	2
CEE 406	Microprocessor systems	3	3	-	2
CEE 407	Electromagnetic waves	3	3	-	2
CEE 408	Electronic tests 4	3	1	3	-
ENG 401	Environmental management	3	3	-	-
Total		15	13	3	6

#### b. Elective

The student selects one course from the elective courses list (3 Credit hours)



## Communication and Electronics Engineering

### Level 5, Semester 1

#### a. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
CEE 501	Digital signal processing	3	3	-	2
CEE 502	Communication systems	3	3	-	2
CEE 503	Communications networks	3	3	-	2
CEE 509	Project 1*	3	2	2	-
Total		12	11	2	6

#### B. Elective

The student selects TWO courses from the elective courses list (6 Credit hours)

## Communication and Electronics Engineering

### Level 5, Semester 2

#### A. Compulsory

Code	Course name	No of units	Hours per week		
			Lect	Lab	Exer
CEE 504	Digital Communications	3	3	-	2
CEE 505	Luminous Communications	3	3	-	2
CEE 506	Electronic tests 5	3	1	3	-
CEE 510	Project 2*	3	2	4	-
Total		12	9	7	4

\* Continuous Course; one oral examination for both CEE509 and CEE510 at the end of the second term

#### B. Elective

The student selects two courses from the elective courses list (6 Credit hours)

*Ministry of higher education  
Higher Institute for Engineering and Technology  
In New Damietta*





## **10. COURSES SPECIFICATIONS**

*Ministry of higher education  
Higher Institute for Engineering and Technology  
In New Damietta*





## **A. Basic Code Courses**

*Ministry of higher education  
Higher Institute for Engineering and Technology  
In New Damietta*





## MTH101 Mathematics 1

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences
Academic Level: 1, Semester: 1	

### A- Basic Information:

Title: Mathematics 1	Code: MTH 101
Prerequisites: -	
Credit hours: 3	
Lecture: 2	Lab: - Exercise: 2 Total: 4

### B - Professional Information:

#### 1- Intended Learning Outcomes of Course related to program outcomes:

1, 5

#### 2- Contents

**Algebra:** vectors algebra - partial fractions – equations theory – vectors – mathematical deduction – numerical solutions methods (simple repetitive method – Newton and modified Newton's method – intersection method – False position method – arrays – linear equations systems – Gauss Jordan method for deletion.

**Derivation :** function (definition – theories) – basic trigonometric functions and its inverse – exponential and logarithmic functions – hyperbolic functions and its inverse – connection (definition – theories)- limits (definition – theories) - derivatives (definition – theories – higher order types) – curves drawing – mathematical and engineering derivative applications - undefined formulas - Taylor expansion – MacLorean expansion – approximation – introduction in partial derivation

#### 3- Teaching and Learning Methods

3.1 lecture	3.2 Tutorial
-------------	--------------

#### 4- Weighting of Assessments

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## MTH102 Mathematics 2

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences
Academic Level: 1,	Semester: 2

### A- Basic Information:

Title: Mathematics 2	Code: MTH 102		
Prerequisites -			
Credit hours: 3			
Lecture: 2	Lab: -	Exercise: 2	Total: 4

### B - Professional Information:

#### 1- Intended Learning Outcomes of Course related to program outcomes:

1, 5

#### 2- Contents

**Analytical geometry:** equations of second degree and double equation for two straight lines – movement and rotation of axes – groups of unified axes circles – conical sectors (properties of conical sectors - parabola – ellipse – hyperbola) – analytical geometry in space – Cartesian coordinates – cylindrical – spherical – plane in space – equations of surfaces in second order – rotation and movement of axes in space

**Integration:** indefinite integration (basic functions – theories) – method of integration (direct – indirect) - definite integration (definition – properties -theories) – applications of definite integration (plain areas – circular volumes – plain technical length) – areas – circular surfaces – numerical integration.

#### 3- Teaching and Learning Methods

3.1 lecture	3.2 Tutorial
-------------	--------------

#### 4- Weighting of Assessments

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## MTH201 Mathematics 3

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences
Academic Level: 2, Semester: 1	

### A- Basic Information:

Title: Mathematics 3	Code: MTH 201
Prerequisites: MTH 101	
Credit hours: 3	
Lecture: 2      Lab: -      Exercise: 2      Total: 4	

### B - Professional Information:

#### 1- 2- Intended Learning Outcomes of Course related to program outcomes:

1, 5

#### 2- Contents

**Partial differentiation applications:** maximum and minimum values in more than one variable – directional analysis - the directional differential effects - the multi integrations and its applications (the curved and the orthogonal axis) – Gauss-Stokes theory - the endless series and function expansion – basic concepts for the convergence and divergence.

**Ordinary differential equations:** The first order (the equations which can be separated, homogeneous, exact and linear) - the ordinary differential equations from the second order and higher orders (with constant and variable coefficients), systems from the ordinary differential equations– Laplace transfer and its applications in the solution of differential equations.

#### 3- Teaching and Learning Methods

3.1 lecture	3.2 Tutorial
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#### 4- Weighting of Assessments

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## MTH202 Mathematics 4

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences
Academic Level: 2, Semester: 2	

### A- Basic Information:

Title: Mathematics 4	Code: MTH 202
Prerequisites: MTH 101	
Credit hours: 3	
Lecture: 2      Lab: -      Exercise: 2      Total: 4	

### B - Professional Information:

#### 1- Intended Learning Outcomes of Course related to program outcomes:

1, 5

#### 2- Contents

Special functions – Fourier series - periodic functions and Euler's laws – Fourier's integrations – solutions of the differential equations by series - solving the partial differential equations using variables separation. Functions with complex variables – complex quantities algebra – multiple values functions - the analytical functions and Koshi's theorem - the complex series – Taylor and Lorant series - the zeros, unique points and the rest - the infinite series.

#### 3- Teaching and Learning Methods

3.1 lecture	3.2 Tutorial
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#### 4- Weighting of Assessments

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **MTH 301 Engineering Probability and Statistics**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences
Academic Level: 3, Semester: 1	

### **A- Basic Information:**

Title: Engineering Probability and Statistics	Code: MTH 301
Prerequisites: -	
Credit hours: 3	
Lecture: 2      Lab: -      Exercise: 2      Total: 4	

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 5

#### **2- Contents**

Probability theory. Discrete and continuous probability distributions. Statistics in engineering. Descriptive Statistics Sampling distributions. Estimation and confidence intervals. Hypothesis testing. Simple regression

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
-------------	--------------

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **MTH 302 Numerical Methods in Engineering**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences
Academic Level: 3,	Semester: 2

### **A- Basic Information:**

Title: Numerical Methods in Engineering	Code: MTH 302
Prerequisites: -	
Credit hours: 3	
Lecture: 2	Lab: -
Exercise: 2	Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 5

#### **2- Contents**

Numerical solution of linear and nonlinear systems - Numerical differentiation and integration - Curve fitting and interpolation - Numerical solution of initial value problems - Boundary and eigen value problems.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
-------------	--------------

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## PHY 101 Physics 1

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences
Academic Level: 1, Semester: 1	

### A- Basic Information:

Title: Physics 1	Code: PHY 101		
Prerequisites: -			
Credit hours: 4			
Lecture: 2	Lab: 2	Exercise: 2	Total: 6

### B - Professional Information:

#### 1- Intended Learning Outcomes of Course related to program outcomes:

1, 2

#### 2- Contents

Material properties – Physical quantities – Standard units and dimensions – frequency motion, mechanical properties for materials –fluid properties – viscosity – surface tension–sound waves – waves in elastic media - Heat and thermodynamics: heat transfer – Gas motion theory – First law of thermodynamics – entropy and second law of thermodynamics – temperature measurements and thermometers.

#### 3- Teaching and Learning Methods

3.1 lecture	3.2 Tutorial
-------------	--------------

#### 4- Weighting of Assessments

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## PHY 102 Physics 2

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences
Academic Level: 1,	Semester: 2

### A- Basic Information:

Title: Physics 2	Code: PHY 102
Prerequisites: -	
Credit hours: 4	
Lecture: 2	Lab: 2
	Exercise: 2
	Total: 6

### B - Professional Information:

#### 1- Intended Learning Outcomes of Course related to program outcomes:

1, 2

#### 2- Contents

Electricity and magnetism: charge and substance- electric field- columb's law- electric flux- Gauss law- electric volt- condenser and insulation materials-current , resistance and electric force – ohm's law and simple circuits- magnetic field- Babot and Savart laws – magnetic flux and gauss law- Faraday law - Magnetic impedance

Topics: engineering light – light properties for spherical surfaces – lenses and mirrors – wave properties for light and Hygen's principle - interference - polarization- and diffraction -

Nuclear physics: nuclear construction – Bohar theorem – principle of quantum theory- laser – optical – electric phenomenon.

#### 3- Teaching and Learning Methods

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### 4- Weighting of Assessments

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **LNG 101 Technical English Language 1**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences
Academic Level: 1,	Semester: 1

### **A- Basic Information:**

Title: Technical English Language 1	Code: LNG 101		
Prerequisites: -			
Credit hours: 2			
Lecture: 2	Lab: 2	Exercise: 0	Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 2

#### **2- Contents**

Intensive guided practice in reading and analyzing expository and argumentative prose and in writing and revising essays that demonstrate coherent logical development, an ability to employ effective strategies of argument and persuasion, and a command of written English appropriate for college-level work

#### **2. Teaching and Learning Methods**

- 3.1 - lecture
- 3.2 - Tutorial
- 3.3 - practical training / lab

#### **3. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %





## **LNG 201 Technical English Language 2**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Basics
Department offering the program:	All Engineering Departments
Department offering the course:	Basic Sciences
Academic Level: <b>2,</b>	<b>Semester: 1</b>

### **A- Basic Information:**

Title: Technical English Language 2	Code: LNG 201		
Prerequisites: LNG 101			
Credit hours: 2			
Lecture: 2	Lab: 2	Exercise: 0	Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 2

#### **2- Contents**

Introduction to academic research and writing through intensive investigation of an issue or topic specified by the instructor. Students will be required to develop and organize a substantial research project related to the topic of the course and to demonstrate the information literacy skills required to find, evaluate, and make appropriate use of primary and secondary materials relevant to their project.

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **B. Engineering Code Courses (ENG)**



## **ENG 101 Mechanics 1**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences
Academic Level: 1, Semester: 1	

### **A- Basic Information:**

Title: Mechanics 1	Code: ENG 101
Prerequisites: -	
Credit hours: 3	
Lecture: 2	Lab: -
Exercise: 2	Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 5

#### **2- Contents**

Applications of space vectors – results of group of Forces - momentums - equivalent couples – equivalent groups - equations of equilibrium for rigid bodies - Supports and pivots types - equilibrium under the effect of forces and the space couples - center of mass (groups of particles - flat surfaces) – moment of inertia (mean axes- equal surfaces)

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
-------------	--------------

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **ENG 102 Mechanics 2**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences
Academic Level: 1, Semester: 2	

### **A- Basic Information:**

Title: Mechanics 2	Code: ENG 102
Prerequisites: -	
Credit hours: 3	
Lecture: 2      Lab: -      Exercise: 2      Total: 4	

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 5

#### **2- Contents**

Position, displacement, velocity, and acceleration of particle – plane motion path of particle – description of plane motion using Cartesian axes – projectiles - tied motion for particle in straight path – motion in fixed axes -motion in polar axes – relative motion between particles - tied motion for particle in circular path – principle of work and energy of motion– principle of conservation of mechanical energy – principle of impulse and momentum of rigid body

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
-------------	--------------

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
<b>Total</b>	<b>100 %</b>



## **ENG 103 Engineering drawing and projection**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: All Engineering Departments  
Department offering the course: Engineering and Basic Sciences  
Academic Level: 1, Semester: 1

### **A- Basic Information:**

Title: Engineering drawing and projection      Code: ENG 103  
Prerequisites: -  
Credit hours: 3  
Lecture: 1      Labs: 4      Exercises: -      Total: 5

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 5, 10, 11

#### **2- Contents**

Techniques and skills of engineering drawing – engineering operations – orthogonal projection – secondary orthogonal – solid bodies – intersections (cutters for solid bodies – intersections of surfaces) - personals – projections of simple bodies – rules of writing dimensions – drawing of perspectives – deduction of missing projections – drawing of engineering sections.

**Drawing of the steel frames** - binding and fixing devices - the assembled drawing for some mechanical steel components

**Introduction to AutoCAD** Fundamentals of engineering drafting by way of computer aided drawing (CAD) software. Basic features and capabilities of CAD software and drafting fundamentals including orthographic projection, and isometric pictorials, part dimensioning in 2 dimensional drawings.

#### **3. Teaching and Learning Methods**

3.1 - lecture      3.2 - Tutorial  
3.3 - practical training / lab

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **ENG 104 Introductions to Computer Systems**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences
Academic Level: 1, Semester: 1	

### **A- Basic Information:**

Title: Introductions to Computer Systems	Code: ENG 104
Prerequisites: -	
Credit hours: 2	
Lecture: 2      Labs: 2      Exercises: -      Total: 4	

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 5, 10, 11

#### **2- Contents**

Computer architecture – computer systems – files systems – computer networks – internet networks – Database systems and information technology – Computer graphics – multimedia systems – methods of solving problems – logical design for the programs and matrices – applications in programming using one structured or visual languages – using this language in solving the engineering problems.

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **ENG 105 Production Engineering**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences
Academic Level: 1, Semester: 1	

### **A- Basic Information:**

Title: Production Engineering	Code: ENG 105		
Prerequisites: -			
Credit hours: 4			
Lecture: 3	Labs: 2	Exercises: -	Total: 5

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 5, 10, 11

#### **2- Contents**

The engineering substances and its properties - heating and cooling diagrams – heating equilibrium diagrams - alloys - casting operation (sand casting and the preparation of the mold) – forming processes (cold and hot forming: forging - rolling – wire drawing – blanking and piercing - deep drawing - the extrusion) – processes of metal connections (the riveting – welding with its types sticking) – cutting processes (cutting elements – processes – hand machining – automatic cutting machining: lathing - shaping – drilling –milling - grinding – work piece fixation - cutting tools fixation - specifications of the operating machine) – measuring tools (venire caliper – micrometers and its types) – engineering specifications – production cycle – production efficiency - industrial safety – practical training in the different workshops

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## ENG 106 Introductions to Engineering and Environment

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Basics
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences
Academic Level: 1, Semester: 2	

### A- Basic Information:

Title: Introductions to Engineering	Code: ENG 106
Prerequisites: -	
Credit hours: 2	
Lecture: 2	Lab: - Exercise: - Total: 2

### B - Professional Information:

#### 1- Intended Learning Outcomes of Course related to program outcomes:

6, 7, 8

#### 2- Contents

**Engineering concepts:** What is engineering – international classification for the engineering jobs – relation between engineering development and environment economic and social development – engineering branches – ethics of the engineering jobs.

**Introduction to environmental science:** the importance of studying environmental science – modern technology and its effect on the environment – quality of the environment and development elements – sources of environmental pollution and method of control (air pollution – water pollution – solid wastes pollution –noise) – economics of environmental pollution control – legislations for the environment protection.

#### 3- Teaching and Learning Methods

3.1 lecture	3.2 Tutorial
-------------	--------------

#### 4- Weighting of Assessments

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## **ENG 201 Computer Programming**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences.
Academic Level: 2, Semester: 1	

### **A- Basic Information:**

Title: Computer Programming	Code: ENG 201		
Prerequisites: -			
Credit hours: 3			
Lecture: 2	Labs: 2	Exercises: -	Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 5, 10, 11

#### **2- Contents**

Basic concepts of programming, problem analysis and developing the programs charts, Primitive data types, operators, variables, Joptionpane & scanner Classes. Flow control I: If statement, If -Else, Nested IF, Switch. Flow control II : for statement, while, do-while, continue, return. Introduction to classes, objects and methods. Introduction to Graphical User Interface (GUI). Java Applets

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **ENG 202 Engineering Thermodynamics**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences
Academic Level: 2, Semester: 1	

### **A- Basic Information:**

Title: Engineering Thermodynamics	Code: ENG 202		
Prerequisites: ENG 102			
Credit hours: 3			
Lecture: 2	Labs: -	Exercises: 2	Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 5, 11

#### **2- Contents**

Fundamental concepts - Properties of a pure substance – Equation of state - thermodynamic systems - Work and heat - First law of thermodynamics; Applications to Systems and Control Volumes - Second Law of Thermodynamics; Principle of Carnot cycles; Heat engines, Refrigerators and heat pumps - Principle of the increase of entropy - Applications to systems and control volumes - Irreversibility and availability - Power and refrigeration cycles.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
-------------	--------------

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **ENG 204 Electrical Engineering Fundamentals**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: All Engineering Departments  
Department offering the course: Communications and Electronics Eng  
Academic Level: 2, Semester: 1

### **A- Basic Information:**

Title: Electrical Engineering Fundamentals Code: ENG 204  
Prerequisites: -  
Credit hours: 4  
Lecture: 3 Labs: - Exercises: 2 Total: 5

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 5, 11

#### **2- Contents**

Direct Current - Theory of electric circuits- Delta and Star connections - Sine A.C and D.C circuits - Time vectors diagram- Electric power and power factor in A.C circuits - 3-Phase current - Electric machines - D.C machines – Transformers - Induction and synchronous machines - Fractional power machines.

#### **3. Teaching and Learning Methods**

3.1 - lecture

3.2 - Tutorial

#### **4. Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **ENG 205 Strength of Materials**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Industrial Engineering & Chemical Engineering
Department offering the course:	Engineering and Basic Sciences
Academic Level: 2, Semester: 1	

### **A- Basic Information:**

Title: Strength of Materials	Code: ENG 205		
Prerequisites: ENG 101			
Credit hours: 3			
Lecture: 2	Labs: -	Exercises: 2	Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 5, 11

#### **2- Contents**

Simple states of stress and strain - Torsion stresses - Bending and shearing stresses in beams - Compound stresses - Analysis of plane stress - Combined stresses - Analysis of thin-walled pressure vessels - Deflection of beams.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
-------------	--------------

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **ENG 206 Introductions to Information Technology**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Dept
Department offering the course:	Engineering and Basic Sciences
Academic Level: 2,	Semester: 2

### **A- Basic Information:**

Title: Introductions to Information Technology Code: ENG 206

Prerequisites: -

Credit hours: 3

Lecture: 2 Labs: - Exercises: 2 Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 5, 11

#### **2- Contents**

Introduction to the design and use of computer-based information systems -  
Software and hardware used in information systems - information requirements -  
Communication systems – Networking - The internet; the foundations, resources  
and uses of the internet, emphasizing practical skills for finding, reading and  
authorizing materials - Fundamentals of computer communication networks –  
Introduction to computer networking elements; communications architectures and  
protocols, HTML principles and applications - Case studies.

#### **3- Teaching and Learning Methods**

3.1 lecture 3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **ENG 207 Technical Report Writing**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Departments
Department offering the course:	Engineering and Basic Sciences
Academic Level: 2,	Semester: 2

### **A- Basic Information:**

Title: Technical Report Writing	Code: ENG 207		
Prerequisites: -			
Credit hours: 2			
Lecture: 2	Labs: 2	Exercises: -	Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

7, 10

#### **2- Contents**

Writing the scientific reports by English language: The principles of report preparation - types of reports – formatting the reports – skills of figures and shapes – importing text – chart drawings – optical scanning for the pictures and documents – the border and notes operations in the reports. Saving and indexing the reports – searching for text – coping and safety of information – using the different computer programs packages for writing and demonstrating the reports.

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **ENG 301 Fluid Mechanics**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: All Departments  
Department offering the course: Engineering and Basic Sciences  
Academic Level: 3, Semester: 1

### **A- Basic Information:**

Title: Fluid Mechanics Code: ENG 301  
Prerequisites: ENG 102  
Credit hours: 3  
Lecture: 2 Labs: 1 Exercises: 1 Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 3, 5

#### **2- Contents**

Fluid properties, fluid statics, kinematics, fluid dynamics including energy and momentum equations, dimensional analysis, laminar flow, turbulent flow and its applications, forces on immersed bodies, introduction to compressible flow, applications to filtration and fluidization.

**Laboratory course** in Fluid Mechanics includes experiments on venture-meter, friction losses in pipes, center of pressure, flow measuring apparatus, multi-pump test (Pump characteristics) and losses in piping systems.

#### **3. Teaching and Learning Methods**

3.1 - lecture 3.2 - Tutorial  
3.3 - practical training / lab

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **ENG 302 Principles of Engineering Design**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Departments
Department offering the course:	Engineering and Basic Sciences

Academic Level: 3, Semester: 1

### **A- Basic Information:**

Title: Principles of Engineering Design	Code: ENG 302
Prerequisites: ENG 103	
Credit hours: 3	
Lecture: 2	Labs: - Exercises: 2 Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 5, 11

#### **2- Contents**

In this course the students are introduced to the proper procedure in engineering design. This procedure includes: Problem formulation, Brain Storming, Selection of best idea, Implementation of the idea and testing it. The principles in each of these steps are explained and clarified using carefully selected case studies, homework, and class work assignments

#### **3- Teaching and Learning Methods**

3.1 lecture 3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## **ENG 303 Engineering Economy**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Departments
Department offering the course:	Engineering and Basic Sciences

Academic Level: 3, Semester: 1

### **A- Basic Information:**

Title: Engineering Economy	Code: ENG 303
Prerequisites: -	
Credit hours: 3	
Lecture: 2	Labs: - Exercises: 2 Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 8, 11

#### **2- Contents**

This course covers the basic concepts of engineering economics as applied to the evaluation of capital investment alternatives in both the private and public sectors of our economy. Attention is given to the time value of money by showing the concepts and techniques for evaluating the worth of products, systems, structures, and services in relation to their cost. Economic and cost concepts: calculating economic equivalence, comparison of alternatives and replacement economy. Economic optimization in design and operations. Cost estimation of products and systems.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **ENG 304 Advanced Computer Programming**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Engineering and Basic Sciences.
Academic Level: 2, Semester: 1	

### **A- Basic Information:**

Title: Advanced Computer Programming	Code: ENG 304		
Prerequisites: ENG 201			
Credit hours: 3			
Lecture: 2	Labs: 2	Exercises: -	Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 5, 10, 11

#### **2- Contents**

Object Oriented Programming introduction: Methods – Classes and Objects: Controlling access to members, Constructor, Overloaded Constructor, software Reusability, Package access, Arrays.

Object Oriented Programming Concepts: Encapsulation, Inheritance, Polymorphism  
Graphical User Interface (GUI): Event handler, text field, list, Multiple Selection lists, Panel, Radio buttons, Checkboxes, layout , Menus, Frames, Popup , Tabbed Pane.

Database Basics

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **ENG 305 Automatic Control**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Communications and Electronics Eng
Department offering the course:	Communications and Electronics Eng
Academic Level: 3, Semester: 1	

### **A- Basic Information:**

Title: Automatic Control	Code: ENG 305
Prerequisites: -	
Credit hours: 3	
Lecture: 2	Labs: - Exercises: 2 Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 3, 5, 11

#### **2- Contents**

Definitions – classification of control systems - Modeling of some physical systems - the closed and opened systems – the block diagram and transfer function – signal flow chart - modeling by case variables – frequency response analysis – the feed back – the stability and its study – analyzing the root path - Nyquist plot analysis – design methods for the feed back control systems (the advanced angle - the leftover angle)

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
-------------	--------------

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **ENG 306 Computer Organization**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Communications and Electronics Eng.
Department offering the course:	Communications and Electronics Eng
Academic Level: 3,	Semester: 1

### **A- Basic Information:**

Title: Computer Organization	Code: ENG 306
Prerequisites: -	
Credit hours: 3	
Lecture: 3	Labs: - Exercises: 2 Total: 5

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 3, 5, 11

#### **2- Contents**

An Introduction to a Simple Computer: CPU Basics and Organization, Bus, Clocks, Input/Output Subsystem, Memory Organization and Addressing, Interrupts  
 Marie Machine: The Architecture, Registers and Buses, Instruction Set Architecture, Register Transfer Notation, Instruction Processing, The Fetch-Decode-Execute Cycle, A Simple Program, What Do Assemblers Do, Extending Our Instruction Set, A Discussion on Decoding—Hardwired vs. Microprogrammed Control.

A Closer Look at Instruction Set Architectures: Instruction Formats, Design Decisions for Instruction Sets, Little versus Big Endian, Internal Storage in the CPU - Stacks versus Registers, Number of Operands and Instruction Length, Instruction-Level Pipelining.

Types of Memory: Memory Hierarchy, Locality of Reference, Cache Memory, Virtual Memory

Input/output and Storage Systems: Introduction, Amdahl's Law, I/O Architectures, I/O Control Methods, I/O Bus Operation, Magnetic Disk Technology, Rigid Disk Drives, Optical Disks

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
-------------	--------------

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## ENG 307 Engineering Management

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Industrial Engineering
Department offering the course:	Industrial Engineering

Academic Level: 3, Semester: 2

### A- Basic Information:

Title: Engineering Management	Code: ENG 307
Prerequisites: -	
Credit hours: 3	
Lecture: 2	Labs: - Exercises: 2 Total: 4

### B - Professional Information:

- 1- **Intended Learning Outcomes of Course related to program outcomes:**  
1, 3, 5, 8, 11

### 2- Contents

**Management:** Principles of management theory – The environment of management – planning – individual and group decision making – organizational culture, structure and design of management – motivating employees – leadership – interpersonal and organizational communication – control techniques for enhancing organizational effectiveness – the human relationships and the organizational behavior.

### 3- Teaching and Learning Methods

3.1 lecture	3.2 Tutorial
-------------	--------------

### 4- Weighting of Assessments

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **ENG 308 Operation Researches**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Engineering and Basic Sciences

Academic Level: 3, Semester: 1

### **A- Basic Information:**

Title: Operation Researches 1	Code: ENG 308		
Prerequisites: MTH 302			
Credit hours: 3			
Lecture: 2	Labs: -	Exercises: 2	Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 2, 3, 5, 12, 14

#### **2- Contents**

Models and methods of operations research in solving engineering and management problems. Linear programming, simplex method, duality, sensitivity analysis; transportation, assignment and transshipment models; network flows models; integer programming Probabilistic models in operations research problems. Queuing theory; Markov chains; decision analysis; Markovian decision process, utility functions

#### **3- Teaching and Learning Methods**

3.1 lecture    3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## **ENG 408 Project Management and Control**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Departments
Department offering the course:	Engineering and Basic Sciences

Academic Level: 4, Semester: 1

### **A- Basic Information:**

Title: Project Management and Control	Code: ENG 408
Prerequisites: -	
Credit hours: 3	
Lecture: 2	Labs: - Exercises: 2 Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 8, 11

#### **2- Contents**

Development, negotiation and specification of project contract. Project planning and control using activity network models; network logic; scheduling; resource allocation; time-cost trade off methods; multi-project resource allocation and leveling using available industrial software.

#### **3- Teaching and Learning Methods**

3.1 lecture    3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## ENG 415 Quality Assurances and Engineering Reliability

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Industrial Engineering
Department offering the course:	Industrial Engineering

Academic Level: 4, Semester: 2

### A- Basic Information:

Title: Quality Assurances and Engineering Reliability	Code: ENG 415
Prerequisites: -	
Credit hours: 3	
Lecture: 2	Labs: - Exercises: 2 Total: 4

### B - Professional Information:

#### 1- Intended Learning Outcomes of Course related to program outcomes:

3, 5, 10, 12, 13, 14

#### 2- Contents

Design of quality control systems; quality methods for establishing product specifications; process control; variables and attributes charts; acceptance sampling; operating characteristics curves; process capabilities; QC software  
 Reliability of parallel and serial engineering systems. Life testing. Impact of reliability on the design process in engineering fields such as mechanical, electrical and structural engineering. Studies the effect of equipment reliability on product quality.

#### 3- Teaching and Learning Methods

3.1 lecture	3.2 Tutorial
-------------	--------------

#### 4- Weighting of Assessments

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **ENG 430 Industrial Training 1 ENG 530 Industrial Training 2**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Industrial Engineering
Department offering the course:	Industrial Engineering

Academic Level: 4, 5 Semester: Summer before the beginning of the level

### **A- Basic Information:**

Title: Industrial Training	Code: ENG 430, ENG 530
Prerequisites: Completion of the previous level	
Credit hours: 0	
Industry field: 30 hours/week for at least three weeks for each course	

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14

#### **2- Contents**

Practical work for at least 90 hours, on a specific practical engineering problem in one of the industrial, service, or consulting establishments under the supervision of a Staff member and a focal person from the selected establishment.

#### **3- Teaching and Learning Methods**

3.1 – Practical industrial field Training

#### **4- Weighting of Assessments**

Mid-Term Examination	0 %
Final Term Examination	0 %
Oral Examination	50 %
Practical Examination	0 %
Semester work	25 %
Report	25 %
Total	100 %

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## **C. Chemical Engineering Code Courses (CHE)**

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## **CHE 101 General Chemistry**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	All Engineering Departments
Department offering the course:	Chemical Engineering
Academic Level: 1, Semester: 1	

### **A- Basic Information:**

Title: General Chemistry	Code: CHE 101		
Prerequisites: -			
Credit hours: 3			
Lecture: 2	Labs: 2	Exercises: -	Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 2

#### **2- Contents**

Gaseous status –substantial and heat balance in fuel burning operations and chemical operations – properties of solutions – dynamic balance in physical and chemical operations – kinetic chemical interactions – electric chemistry – introduction to chemical corrosion – water processing – building materials – pollution and its treatment.

**Selected chemical industries:** chemical manures – dyes – polymers – sugar – petrochemicals – semi conductors – oil, greases and industrial detergents.

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 201 Chemical Engineering Principles I**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 2, Semester: 1	

### **A- Basic Information:**

Title: Chemical Engineering Principles I                      Code: CHE 201

Prerequisites: CHE 101

Credit hours: 3

Lecture: 2                      Lab: 0                      Exercises: 2                      Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 3, 5, 6, 11

#### **2- Contents:**

Basic concepts of material and energy balances - Combined material and energy balances - Balances on non-reactive and reactive processes - Application of material and energy balances on unit operations.

#### **3- Teaching and Learning Methods**

3.1 lecture                      3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 202 Organic Chemistry**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 2, Semester: 1	

### **A- Basic Information:**

Title: Organic Chemistry	Code: CHE 202		
Prerequisites: CHE 101			
Credit hours: 4			
Lecture: 3	Lab: 2	Exercises: 0	Total: 5

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to Program outcomes:**

1, 5, 11

#### **2- Contents:**

Modern presentation of organic chemistry stressing theory and mechanism - extensive use of resonance and conformational analysis; alkanes, cycloalkanes, alkyl halides, alcohols, ethers, alkenes, alkynes, and stereochemistry - Spectroscopy, aromatic compounds, aldehydes and ketones, carboxylic acids and their derivatives, amines, and poly functional compounds.

Organic aminates – carbohydrates – general study on the aromatic and organic compounds specially Benzene, naftaline and antherasine - study for the hydration, oxidation, halogination, nitration and carbonation and some other operations for the organic compounds. Preparation of the azo and diazo compounds and its importance – alcohols and aldehydes, caitonates and the aromatic acids.

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %





## **CHE 203 Inorganic Chemistry**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: Chemical Engineering  
Department offering the course: Chemical Engineering  
Academic Level: 2, Semester: 1

### **A- Basic Information:**

Title: Inorganic Chemistry Code: CHE 203

Prerequisites: CHE 101

Credit hours: 3

Lecture: 3 Lab: 2 Exercises: 0 Total: 5

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to Program outcomes:**

1, 5, 11

#### **2- Contents:**

Comparative study for the following groups of materials with focusing on the compounds which are important to the industry " Haogyns – sulpher group – alkalines – earth alcalynes – familiar items of the fourth and fifth groups in the periodic table – transient metals – selected topics in the inorganic chemistry

#### **3. Teaching and Learning Methods**

3.1 - lecture 3.2 - Tutorial  
3.3 - practical training / lab

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 301 Physical Chemistry**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: Chemical Engineering  
Department offering the course: Chemical Engineering  
Academic Level: 3, Semester: 1

### **A- Basic Information:**

Title: Physical Chemistry Code: CHE 301  
Prerequisites: CHE 101  
Credit hours: 4  
Lecture: 3 Lab: 2 Exercises: - Total: 5

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1

#### **2- Contents:**

Rates of reaction - effects of temperature and pressure on the reaction rate - Adsorption in gases and liquids - Surface reactions - Kinetic theory of gases - Transport properties of gases from molecular theory - PVT relations and equations of state - Dalton and Amagat laws - Zeroth, first, second and third laws of thermodynamics - Raoult's law and vapor-liquid equilibria - Chemical equilibrium and effects of temperature and pressure on the equilibrium constant.

Physical Chemistry Laboratory: Selected experiments in physical chemistry. Experiments cover rates of reaction, effects of temperature and pressure on the reaction rate - Adsorption in gases and liquids - Surface reactions.

#### **3. Teaching and Learning Methods**

3.1 - lecture 3.2 - Tutorial  
3.3 - practical training / lab

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 302 Material Science and Metallurgy**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 3, Semester: 1	

### **A- Basic Information:**

Title: Material Science and Metallurgy	Code: CHE 302		
Prerequisites: ENG 205			
Credit hours: 3			
Lecture: 3	Lab: 0	Exercises: 2	Total: 5

### **B – Professional Information:**

#### **1- Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5

#### **2- Contents:**

Students in this course learn about tools of examination, temperature measurement, metallography, tests for mechanical properties, non-destructive testing, crystalline structure of metals, plastic deformation and working of metals, solidification, solidification theory of liquid metals, equilibrium phase diagrams of binary systems, the iron carbon phase diagram, phase transformations in steel, heat treatment of steel, classification of steels, and the effect of alloying elements, tool steels, cast irons, non-ferrous metals and alloys, metals at high and low temperatures, wear of metals and failure analysis

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 303 Chemical Engineering Principles II**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: Chemical Engineering  
Department offering the course: Chemical Engineering  
Academic Level: 3, Semester: 1

### **A- Basic Information:**

Title: Chemical Engineering Principles II Code: CHE 303

Prerequisites: CHE 201

Credit hours: 3

Lecture: 3                      Lab: 0                      Exercises: 2                      Total: 5

### **B – Professional Information:**

#### **1- Intended Learning Outcomes of Course related to Program outcomes:**

1, 3, 5, 6, 11

#### **2- Contents:**

Simultaneous material and energy balances of complete process flowsheets – Introduction of computer methods to solve chemical engineering problems – Equation-based approach. Degrees of freedom analysis – Conceptual design of chemical processes – Introduction to basic Chemical Engineering processes (e.g. humidification, binary distillation, extraction) – Computer-aided process design.

#### **3- Teaching and Learning Methods**

3.1 lecture    3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 304 Chemical Engineering Thermodynamics**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: Chemical Engineering  
Department offering the course: Chemical Engineering  
Academic Level: 3, Semester: 1

### **A- Basic Information:**

Title: Chemical Engineering Thermodynamics Code: CHE 304

Prerequisites:

Credit hours: 3

Lecture: 3      Lab: 2      Exercises: -      Total: 5

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes:**

1, 5, 11

#### **2. Contents:**

Thermodynamic properties of homogeneous mixtures - partial molal properties - Fugacity. Ideal and non ideal solutions - Heat effects of mixing. Excess properties - Phase equilibria; miscible systems; activity coefficient - Gibbs-Duhem Equations - Chemical reactions equilibria.

#### **3. Teaching and Learning Methods**

3.1 - lecture      3.2 - Tutorial  
3.3 - practical training / lab

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 305 Analytical Chemistry**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 3, Semester: 2	

### **A- Basic Information:**

Title: Analytical Chemistry	Code: CHE 305		
Prerequisites: CHE 101			
Credit hours: 3			
Lecture: 3	Lab: 2	Exercises: -	Total: 5

### **B - Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1

#### **2. Contents:**

Theory and techniques of gravimetric and volumetric analysis, and fundamentals of electro analytical chemistry.

Analytical Chemistry Laboratory: Selected experiments designed to reinforce concepts covered in CHE 301.

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 306 Process Dynamics and Control**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 3, Semester: 2	

### **A- Basic Information:**

Title: Process Dynamics and Control	Code: CHE 306
Prerequisites: -	
Credit hours: 3	
Lecture: 2      Lab: 2      Exercises: 0      Total: 4	

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to Program outcomes:**

1, 2, 3, 5, 6, 7, 11

#### **2- Contents:**

Automatic control merits and basic features – Classification of control action (open-loop and closed-loop, feed-back and feed-forward, process and position control) – Mathematical tools (Linearization, Laplace transforms and block diagram algebra), Process dynamics (first, second and higher orders) – Measuring and actuating elements – Two-position controller – Three-term controller – Controller mechanism and optimum setting – System stability (algebraic and graphical methods).  
Laboratory experiments demonstrating the principles covered. These include temperature, pressure, flow and concentration measuring devices, and process control simulation for typical chemical plants.

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## CHE 401 Reactor Design

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 4, Semester: 1	

### A- Basic Information:

Title: Reactor Design	Code: CHE 401		
Prerequisites: MTH 302, CHE 304			
Credit hours: 4			
Lecture: 3	Lab: 0	Exercises: 2	Total: 5

### B – Professional Information:

#### 1- Intended Learning Outcomes of Course related to Program outcomes:

1, 2, 3, 5, 7, 11

#### 2- Contents:

Fundamentals of thermodynamics and kinetics of chemical reactions - Analysis of batch, plug-flow and continuous stirred tank reactors for different types of reactions - Non ideal reactor analysis, including residence time distribution, back mixing and dispersion models - Kinetics of isothermal and non-isothermal ideal reactors.

Kinetics of heterogeneous or catalytic reactions - Design of different types of catalytic and non-catalytic reactors - Mass and energy transfer limitations in heterogeneous reaction systems - Catalyst effectiveness - Reactor stability and sensitivity to operating parameters - Optimization of reactor design - Factors affecting choice of reactors.

#### 3- Teaching and Learning Methods

3.1 lecture	3.2 Tutorial
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#### 4- Weighting of Assessments

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## **CHE 402 Heat Transfer**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: Chemical Engineering  
Department offering the course: Chemical Engineering  
Academic Level: 4, Semester: 1

### **A- Basic Information:**

Title: Heat Transfer Code: CHE 402

Prerequisites: ENG 202

Credit hours: 3

Lecture: 3 Lab: 2 Exercises: - Total: 5

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to Program outcomes:**

1, 5, 11

#### **2- Contents:**

The Heat Transfer course requires that students apply their knowledge of mathematics and science to real thermal engineering systems. In this course an expansion of students engineering skills, developed in thermodynamics and fluid mechanics, is undertaken. Students are required to identify, formulate and solve thermal problems using a combination of mass and energy balances and energy rate equations. The course combines analytical techniques and design principles as applied to thermal systems. The students will have a full understanding of conduction, convection, radiation, condensation and boiling heat transfer and will be able to design a heat exchanger system.

Laboratory experiments on conduction, convection, radiation, drop-wise and film condensation, nucleate and film boiling and heat exchangers.

#### **3. Teaching and Learning Methods**

3.1 - lecture 3.2 - Tutorial  
3.3 - practical training / lab

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 403 Mass Transfer**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 4, Semester: 1	

### **A- Basic Information:**

Title: Mass Transfer	Code: CHE 403		
Prerequisites: ENG 202			
Credit hours: 3			
Lecture: 3	Lab: 0	Exercises: 2	Total: 5

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to Program outcomes:**

1, 5, 11

#### **2- Contents:**

Molecular mass transport in fluids - Transport Phenomena and the basic equation of change - Molecular mass transport in liquids - Mass transport phenomena in solids - Mass transfer coefficient in laminar and turbulent flow – Inter-phase mass transport - Continuous two-phase mass transport processes.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 404 Corrosion Engineering**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level:	4, Semester: 1

### **A- Basic Information:**

Title: Corrosion Engineering	Code: CHE 404		
Prerequisites: CHE 303			
Credit hours: 2			
Lecture: 2	Lab: 0	Exercises: 2	Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2- Contents:**

Theories and principles of corrosion and prevention - Localized corrosion, pitting, crevice corrosion, cavitations - metallurgical factors - welding problems - material selection - stress corrosion cracking corrosion fatigue - inspection, nondestructive testing - water treatment for boilers and condensers - chemical cleaning flue gas attack - corrosion testing evaluation and simulation - corrosion monitoring and cathode protection.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 405 Mass Transfer Operations**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 4, Semester: 1	

### **A- Basic Information:**

Title: Mass Transfer Operations	Code: CHE 405		
Prerequisites: CHE 403			
Credit hours: 3			
Lecture: 3	Lab: 0	Exercises: 2	Total: 5

### **B - Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 3, 5, 11

#### **2. Contents:**

Molecular mass transport in fluids - Transport Phenomena and the basic equation of change - Molecular mass transport in liquids - Mass transport phenomena in solids - Mass transfer coefficient in laminar and turbulent flow – Inter-phase mass transport - Continuous two-phase mass transport processes.

A laboratory course in mass transfer operations covering experiments on: Vapor-liquid equilibria (VLE), binary system distillation (plate and packed columns), solid-liquid extraction, double-effect evaporation, spray drying. Some reaction kinetics experiments such as tubular reactions are also included.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 406 Bio Organic Chemistry**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering

Academic Level: **4**, Semester: **2**

### **A- Basic Information:**

Title: Bio organic chemistry	Code: CHE 406
Prerequisites: CHE 203	
Credit hours: 3	
Lecture: 3	Labs: - Exercises: 2 Total: 5

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

3, 5, 10, 12, 13, 14

#### **2- Contents**

Principles – Carbohydrates – aminoacids – proteins –fatty acids –oils and fats – pharmaceutical compounds

#### **3- Teaching and Learning Methods**

3.1 lecture 3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 407 Mechanical unit operation**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering

Academic Level: **4**, Semester: **2**

### **A- Basic Information:**

Title: Mechanical unit operation	Code: CHE 407
Prerequisites: CHE 304	
Credit hours: 3	
Lecture: 3	Labs: - Exercises: 2 Total: 5

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 3, 5, 7, 11

#### **2- Contents**

This course is a study of necessary equations of design to apply them in the design of different chemical processes: absorption and stripping, distillation, solvent extractions, evaporative cooling, solid drying, crystallization, ion exchange, filtration, screening, sedimentation, computation methods in multistage and multicomponent systems and operations including particulate solids.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 408 Process Modeling and Simulation**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 4, Semester: 2	

### **A- Basic Information:**

Title: Process Modeling and Simulation                      Code: CHE 408

Prerequisites: MTH 302, CHE 405

Credit hours: 3

Lecture: 3              Lab: 2              Exercises: -              Total: 5

### **B - Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Review of the basic principles of transport of momentum, heat, and mass with applied problems. Numerical methods for solving more complex problems of transport phenomena and kinetics.

#### **3. Teaching and Learning Methods**

3.1 - lecture    3.2 - Tutorial  
3.3 - practical training / lab

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 411 Liquefied Natural Gas**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 4, Semester: 1	

### **A- Basic Information:**

Title: Liquefied Natural Gas	Code: CHE 411		
Prerequisites: CHE 304			
Credit hours: 3			
Lecture: 2	Lab: 0	Exercises: 2	Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 2, 3, 5, 7, 10, 11

#### **2. Contents:**

Refrigeration systems - Natural gas preparation and liquefaction, thermodynamic aspects of liquefaction, liquefaction plants - Properties of LNG - Vaporization losses and custody transfer.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## **CHE 412 Air Pollution**

### **Course Specifications:**

Program on which the course is given: Chemical Engineering  
Major or Minor element of program: Minor  
Department offering the program: Chemical Engineering  
Department offering the course: Chemical Engineering  
Academic Level: 4, Semester: 1

### **A- Basic Information:**

Title: Air Pollution Code: CHE 412  
Prerequisites: Dept. approval  
Credit hours: 3  
Lecture: 2 Lab: 0 Exercises: 2 Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 6, 8, 10

#### **2. Contents:**

Sources, measurements and equipment design for removal of air pollutants - Effects of air pollutants - Dispersion of pollutants in the atmosphere - Particulate matter and its control equipment - Atmospheric photochemical reactions - Instrumentation and emission testing equipment.

#### **3- Teaching and Learning Methods**

3.1 lecture 3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 413 Gas Engineering**

### **Course Specifications:**

Program on which the course is given: Chemical Engineering  
Major or Minor element of program: Minor  
Department offering the program: Chemical Engineering  
Department offering the course: Chemical Engineering  
Academic Level: 4, Semester: 2

### **A- Basic Information:**

Title: Gas Engineering Code: CHE 413  
Prerequisites: CHE 304, CHE 403  
Credit hours: 3  
Lecture: 2 Lab: 0 Exercises: 2 Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5,11

#### **2. Contents:**

Characterization of natural gas systems - Properties of natural gas systems - Product specification - Qualitative phase behavior - Retrograde condensation - Calculation of vapor-liquid equilibria and applications - Design of multistage separation - Water-hydrocarbon system-dehydration - Overview of sweetening, gas preparation and liquefaction.

#### **3- Teaching and Learning Methods**

3.1 lecture 3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 414 Polymer Engineering**

### **Course Specifications:**

Program on which the course is given:	Chemical Engineering
Major or Minor element of program:	Minor
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 4, Semester: 2	

### **A- Basic Information:**

Title: Polymer Engineering	Code: CHE 414		
Prerequisites: CHE 101			
Credit hours: 3			
Lecture: 2	Lab: 0	Exercises: 2	Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5,11

#### **2. Contents:**

Structure and physical properties of polymers, polymer solutions, analysis and testing of polymers, measurement of molecular weight - Types of polymerization reactions; manufacture of polymers; process type of reactors - Polymer processing; plastics, elastomers; properties of commercial polymers; thermoplastics and thermosetting resins.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 415 Engineering Materials Selection**

### **Course Specifications:**

Program on which the course is given: Chemical Engineering  
Major or Minor element of program: Minor  
Department offering the program: Chemical Engineering  
Department offering the course: Chemical Engineering  
Academic Level: 4, Semester: 1

### **A- Basic Information:**

Title: Engineering Materials Selection Code: CHE 415  
Prerequisites: CHE 302  
Credit hours: 3  
Lecture: 2 Lab: 0 Exercises: 2 Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5,11

#### **2. Contents:**

Application of engineering of materials science principles in the selection and/or specification of metals, ceramics, and plastic materials for use in structural, mechanical, and chemical usage. Mechanical properties, corrosion, oxidation, and variation of properties with temperature are considered.

#### **3- Teaching and Learning Methods**

3.1 lecture 3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 416 Water Desalination**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: Chemical Engineering  
Department offering the course: Chemical Engineering  
Academic Level: 4, Semester: 2

### **A. Basic Information:**

Title: Water Desalination Code: CHE 416  
Prerequisites: CHE 402  
Credit hours: 3  
Lecture: 2 Lab: 0 Exercises: 2 Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 2, 3, 5, 7, 11

#### **2. Contents:**

The course covers the basic concept of water desalination and combines water chemistry, scaling, corrosion, heat transfer principles, material behavior, and design principles as applied to desalination processes. Attention is given to the thermal (flash, vapor compression) and non-thermal (reverse-osmosis, electro -dialysis) desalination techniques. Water properties and quality criteria and standards as well as corrosion behavior and its control in desalination plants will be discussed.

#### **3- Teaching and Learning Methods**

3.1 lecture 3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 417 Polymer Processing**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 4, Semester: 2	

### **A- Basic Information:**

Title: Polymer Processing	Code: CHE 417
Prerequisites: CHE 305	
Credit hours: 3	
Lecture: 2      Lab: 0      Exercises: 2      Total: 4	

### **B - Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 2, 3, 5, 7, 11

#### **2. Contents:**

Theory and practice of polymer processing. Non-Newtonian flow, extrusion, injection-molding, fiber, film, and rubber processing. Kinetics of and structural development during solidification. Physical characterization of microstructure and macroscopic properties. Component manufacturing and recycling issues, compounding and blending

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## CHE 501 Chemical Engineering Computer applications

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering

Academic Level: 5, Semester: 1

### A- Basic Information:

Title: Chemical Engineering Computer applications	Code: CHE 501
Prerequisites: ENG 104	
Credit hours: 3	
Lecture: 3	Labs: 2 Exercises: - Total: 5

### B - Professional Information:

#### 1- Intended Learning Outcomes of Course related to program outcomes:

1, 5, 11

#### 2- Contents

This is the study of contemporary computer tools toward chemical engineering. Students design, develop and deploy computer applications or as applications which can be implemented via the internet. These applications are developed for inventory and production control systems, statistical application, database/data mining applications and for software system integration. Software tools and packages utilized include: XML, Javascript, Java, MATLAB, MSVBA, and MS Access.

#### 3. Teaching and Learning Methods

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### 4. Weighting of Assessments

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 502 Petrochemical Engineering**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 5, Semester: 1	

### **A- Basic Information:**

Title: Petrochemical Engineering	Code: CHE 502
Prerequisites: CHE 101, CHE 201	
Credit hours: 3	
Lecture: 3      Lab: 0      Exercises: 2      Total: 5	

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5,11

#### **2. Contents:**

Petroleum chemistry; occurrence, composition of crude oil, distillation, catalytic and thermal cracking, alkylation, hydrogenation, isomerization, polymerization -. Techniques and economics of the production of basic and intermediate petrochemicals as well as some end products

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## **CHE 503 Industrial Technologies in Chemical Engineering**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 5, Semester: 1	

### **A- Basic Information:**

Title: Industrial Technologies in Chemical Engineering Code: CHE 503

Prerequisites: Completion of 100 Credit hours and Consent of Department

Credit hours: 3

Lecture: 3      Lab: 2      Exercises: -      Total: 5

### **B - Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 2, 3, 5, 7, 11

#### **2. Contents:**

Introduction in the chemical industries and definitions – Combined processes in the chemical creation – nitration – sulphurization – halogenations – Oxidation – polymerization – concentration on the organic industrial processes including the combined processes with operation charts until the final products - study of different physical and industrial knitting – natural knitting – cottons – wool etc..

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 504 Plant Design**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 5, Semester: 1	

### **A- Basic Information:**

Title: Plant Design	Code: CHE 504		
Prerequisites: CHE 401, CHE 405			
Credit hours: 3			
Lecture: 3	Lab: 0	Exercises: 2	Total: 5

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 3, 5, 6

#### **2. Contents:**

Process choice, synthesis and screening of alternatives - Project planning - Safety and environmental issues - Construction of a detailed flow sheet using a process simulator (currently HYSIS) - Material and energy balances - Conservation of material and energy flows. Detailed design of equipment: size, construction details, materials of construction, instrumentation and control. Process economics: capital cost estimation, manufacturing cost estimation, profit forecast, return on investment - Sensitivity to errors in cost estimates - Venture analysis: the combined effect of technological and commercial uncertainties, the quantification of risk - Planning investment.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
-------------	--------------

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 505 Petroleum Refining Engineering**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 5, Semester:	1

### **A- Basic Information:**

Title: Petroleum Refining Engineering	Code: CHE 505		
Prerequisites: CHE 405			
Credit hours: 3			
Lecture: 3	Lab: 0	Exercises: 2	Total: 5

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 3, 5, 6

#### **2. Contents:**

Refinery organization - Refinery feed stocks and products - Crude distillation - Cracking and reforming – Hydrotreating - Alkylation. Lubricating oils production - Petroleum gases – Hydroprocessing; product blending, environmental constraints on refinery products - Term project using actual refinery data to be utilized for typical design calculation on the above operations.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
-------------	--------------

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 509 Project 1\***

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering
Academic Level: 5, Semester: 1	

### **A- Basic Information:**

Title: Project 1*	Code: CHE 509		
Prerequisites: Completion of 144 Credit hours and Consent of Department			
Credit hours: 3			
Lecture: 2	Labs: 2	Exercises: -	Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14

#### **2- Contents**

Students will be assigned Chemical industrial projects in which they will be expected to apply Principles of Chemical Engineering analysis and design to solve a given real world problem. Reports and presentations will be emphasized in addition to the technical content.

#### **3- Teaching and Learning Methods**

- 3.1 - lecture
- 3.2 - Tutorial
- 3.3 - practical training / lab and industry visits

#### **4- Weighting of Assessments**

Mid-Term Examination	0 %
Final Term Examination	0 %
Oral Examination	50 % at the end of IE 510
Practical Examination	0 %
Semester work	50 %
Other types	0 %
Total	100 %

\* Continuous Course; one oral examination for both CHE 509 and CHE 510 at the end of CHE 510



## **CHE 510 Project 2**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering

Academic Level: **5**, Semester: **2**

### **A- Basic Information:**

Title: Project 2	Code: CHE 510		
Prerequisites: CHE 509			
Credit hours: 3			
Lecture: 2	Labs: 4	Exercises: -	Total: 6

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14

#### **2- Contents**

Continuation and conclusion of the investigations on the chemical industrial problems of Project I; written reports and team presentations are required.

#### **3- Teaching and Learning Methods**

- 3.1 - lecture
- 3.2 - Tutorial
- 3.3 - practical training / lab and industry visits

#### **4- Weighting of Assessments**

Mid-Term Examination	0 %
Final Term Examination	0 %
Oral Examination	50 %
Practical Examination	0 %
Semester work	25 %
Report evaluation	25 %
Total	100 %

\* Continuous Course; one oral examination for both CHE 509 and CHE 510 at the end of CHE 510



## **CHE 511 Electroplating**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering

Academic Level: **5**, Semester: **1**

### **A- Basic Information:**

Title: Electroplating	Code: CHE 511
Prerequisites: -	
Credit hours: 3	
Lecture: 2      Lab: 0      Exercises: 2      Total: 4	

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

3, 5, 10, 12, 13, 14

#### **2- Contents**

Electrochemistry – Electrochemical cells – Surface preparation – throwing power – Electrochemical baths – Factors affecting electroplating – temperature – bath concentration.

#### **3- Teaching and Learning Methods**

3.1 lecture      3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## CHE 512 Ceramics

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering

Academic Level: 5, Semester: 1

### A- Basic Information:

Title: Ceramics	Code: CHE 512
Prerequisites: -	
Credit hours: 3	
Lecture: 2	Lab: 0
Exercises: 2	Total: 4

### B - Professional Information:

#### 1- Intended Learning Outcomes of Course related to program outcomes:

3, 5, 10, 12, 13, 14

#### 2- Contents

General ceramics fabrication processes – preparation of raw material – cold forming processes – ceramic building material; bricks, tiles, sewer pipes – sanitary ware.

#### 3- Teaching and Learning Methods

3.1 lecture	3.2 Tutorial
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#### 4- Weighting of Assessments

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 513 Refractories**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering

Academic Level: 5, Semester: 1

### **A- Basic Information:**

Title: Refractories	Code: CHE 513
Prerequisites: -	
Credit hours: 3	
Lecture: 2      Lab: 0      Exercises: 2      Total: 4	

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

3, 5, 10, 12, 13, 14

#### **2- Contents**

Glazes – drying – firing – hot forming and melt forming – stone ware – porcelain, gypsum – enameling abrasives – Cement – Properties of refractories. Equilibrium diagrams.

#### **3- Teaching and Learning Methods**

3.1 lecture      3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %







## **CHE 515 Painting Technology**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering

Academic Level: **5**, Semester: **1**

### **A- Basic Information:**

Title: Painting Technology	Code: CHE 515
Prerequisites: -	
Credit hours: 3	
Lecture: 2      Lab: 0      Exercises: 2      Total: 4	

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

3, 5, 10, 12, 13, 14

#### **2- Contents**

Paints compositions – Classification of paints – primers and final coats – surface preparation – reaction of paint systems. Paints for corrosion resistance.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
-------------	--------------

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 516 Waste water treatment**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering

Academic Level: **5**, Semester: **1**

### **A- Basic Information:**

Title: Waste water treatment	Code: CHE 516
Prerequisites: -	
Credit hours: 3	
Lecture: 2      Lab: 0      Exercises: 2      Total: 4	

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

3, 5, 10, 12, 13, 14

#### **2- Contents**

Water analysis – Water treatment – clarification – disinfection – activated sludge process – Biological waste treatment

#### **3- Teaching and Learning Methods**

3.1 lecture    3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %











## **CHE 521 Plasticizers**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering

Academic Level: **5**, Semester: **2**

### **A- Basic Information:**

Title: Plasticizers	Code: CHE 521
Prerequisites: -	
Credit hours: 3	
Lecture: 2      Lab: 0      Exercises: 2      Total: 4	

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

3, 5, 10, 12, 13, 14

#### **2- Contents**

Study for the properties – important and effect of their applications – Study for the different techniques of their addition to polymers.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## CHE 522 Foams

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering

Academic Level: 5, Semester: 2

### A- Basic Information:

Title: Foams

Code: CHE 522

Prerequisites: -

Credit hours: 3

Lecture: 2      Lab: 0      Exercises: 2      Total: 4

### B - Professional Information:

#### 1- Intended Learning Outcomes of Course related to program outcomes:

3, 5, 10, 12, 13, 14

#### 2- Contents

Chemical composition and raw materials – low and high density foams – testing of foams – additives improving properties.

#### 3- Teaching and Learning Methods

3.1 lecture

3.2 Tutorial

#### 4- Weighting of Assessments

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 523 Rubber**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering

Academic Level: **5**, **Semester: 2**

### **A- Basic Information:**

Title: Rubber	Code: CHE 523
Prerequisites: -	
Credit hours: 3	
Lecture: 2      Lab: 0      Exercises: 2      Total: 4	

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

3, 5, 10, 12, 13, 14

#### **2- Contents**

Natural rubber – isoprene – rubbers – elastomers – chemical vulcanization reaction – ABS.

#### **3- Teaching and Learning Methods**

3.1 lecture      3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CHE 524 Food Processing Technology**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering

Academic Level: **5**, Semester: **2**

### **A- Basic Information:**

Title: Food Processing Technology Code: CHE 524

Prerequisites: -

Credit hours: 3

Lecture: 2      Lab: 0      Exercises: 2      Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

3, 5, 10, 12, 13, 14

#### **2- Contents**

#### **3- Teaching and Learning Methods**

3.1 lecture

3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## **CHE 526 Selected Topics in Chemical Engineering**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Chemical Engineering
Department offering the course:	Chemical Engineering

Academic Level: **5**, Semester: **2**

### **A- Basic Information:**

Title: Selected Topics in Chemical Engineering Code: CHE 525

Prerequisites: -

Credit hours: 3

Lecture: 2      Lab: 0      Exercises: 2      Total: 4

### **B - Professional Information:**

#### **1- Intended Learning Outcomes of Course related to program outcomes:**

3, 5, 10, 12, 13, 14

#### **2- Contents**

Special topics to be selected by the department to address new subjects in Chemical Engineering.

#### **3- Teaching and Learning Methods**

3.1 lecture      3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %

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In New Damietta*



## **D. Communications and Electronics Engineering Code Courses (CEE)**

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In New Damietta*





## CEE 201 Electronics 1

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 2, Semester: 1	

### A- Basic Information:

Title: Electronics 1 Code: CEE 201

Prerequisites: -

Credit hours: 3

Lecture: 3 Lab: 0 Exercises: 2 Total: 5

### B - Professional Information:

#### 1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):

1, 5, 11

#### 2. Contents:

Bipolar joint applications –Transistor principles and the dynamic and static characteristics – Thyristor - single pole elements - the basic characteristics - principles of the light sender elements - the laser from the semiconductors - the revealer of the light - the luminous cells - the laser characteristics and its applications - a technology of the integral circles - the crystal growth - the oxidation - the precipitation of the film - the spread - the printing of the circuits and the digging.

#### 3- Teaching and Learning Methods

3.1 lecture 3.2 Tutorial

#### 4- Weighting of Assessments

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## **CEE 202 Electronics and Electrical Measurements**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: Electronics and Communications Eng.  
Department offering the course: Electronics and Communications Eng.  
Academic Level: 2, Semester:

### **A- Basic Information:**

Title: Electronics and Electrical Measurements      Code: CEE 202

Prerequisites: -

Credit hours: 4

Lecture: 3      Lab: -      Exercises: 2      Total: 5

### **B - Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Definitions - functions and properties of the measurement equipments - Standard measurements - the statistical analysis for the error in the measurement – wave's indicator – signals generator - digital measuring equipments - recording measuring equipments – energy converters – Data transfer systems from digital to numerical – testing systems with computer control.

#### **3. Teaching and Learning Methods**

3.1 - lecture      3.2 - Tutorial  
3.3 - practical training / lab

#### **4. Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 203 Electronics Tests 1**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: Electronics and Communications Eng.  
Department offering the course: Electronics and Communications Eng.  
Academic Level: 2, Semester:1

### **A- Basic Information:**

Title: **Electronics Tests 1** Code: CEE 203  
Prerequisites: CEE 201  
Credit hours: 2  
Lecture: 1 Lab: 3 Exercises: - Total: 4

### **B - Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 2, 5, 11

#### **2. Contents:**

Conducting experiments which covers the basics of electronics and the logical circuits using testing and electronic measurement equipments – Methods of measurements - elements and methods of testing and programming of the computer

#### **3. Teaching and Learning Methods**

3.1 - lecture 3.2 - Tutorial  
3.3 - practical training / lab

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 204 Electronics 2**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level:	2, Semester: 1

### **A- Basic Information:**

Title: Electronics 2	Code: CEE 204		
Prerequisites: CEE 201			
Credit hours: 4			
Lecture: 4	Lab: 0	Exercises: 2	Total: 6

### **B - Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

The characteristics and processing of (JFET) and (MOSFET) - the effect of the surfaces - effect of the narrow canal - different types for MOS - feeding circuits of FET - Digital and analog applications of FET - single circuits industry - elements of the mobile charge - the integrated circuits with high numbers - the testing of a correlation and assembling of the integrated circuits - the basic regular circuits (the transistors) – design of power circuits - nourishing an organizer - the resort the volt - PNP valve - THYRISTOR applications – two directions equipments - the cell of the semi-conductive and its related equipments

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 301 Fundamentals of Electromagnetism**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: Electronics and Communications Eng.  
Department offering the course: Electronics and Communications Eng.  
Academic Level: 3, Semester: 1

### **A- Basic Information:**

Title: Fundamentals of Electromagnetism Code: CEE 301

Prerequisites: -

Credit hours: 3

Lecture: 3 Lab: - Exercises: 2 Total: 5

### **B - Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Direction analysis - the basic relations for static electric field – Gauss law - the volt function - the theory of separation – Laplace equation – Poisson's equation - electrostatic power - magnetic field theories - the magnetic inductance and Faraday law - magnetic direction volt - similarity between the magnetic field and the electric field - the continuity equation in time - the conditions at the ambient surface - the temporal variable fields and Maxwell's equations

#### **3. Teaching and Learning Methods**

3.1 - lecture 3.2 - Tutorial  
3.3 - practical training / lab

#### **4. Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 302 Logical and digital circuits**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: Electronics and Communications Eng.  
Department offering the course: Electronics and Communications Eng.  
Academic Level: 3, Semester: 1

### **A. Basic Information:**

Title: Digital and logical circuits Code: CEE 302  
Prerequisites: CEE 204  
Credit hours: 3  
Lecture: 3 Lab: 0 Exercises: 2 Total: 5

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 2, 5, 11

#### **2. Contents:**

Boolean algebra – Logic gates – Logic Minimization - Logic and digital units concepts–number systems and data representation–k-maps Boolean algebra–decision elements – combinational and sequential circuits – flip - flops – minimization techniques , design and construction of logic subsystems – such as decoders , multiplexers , adders , and multipliers – Combinational logic circuits – sequential logic circuits –Introduction to AID and DIA converters – Introduction to digital Integrated circuits

#### **3- Teaching and Learning Methods**

3.1 lecture 3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 305 Electronic Circuits 1**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: Electronics and Communications Eng.  
Department offering the course: Electronics and Communications Eng.  
Academic Level: 3, Semester: 1

### **A- Basic Information:**

Title: Electronic Circuits 1 Code: CEE 305  
Prerequisites: CEE 201  
Credit hours: 3  
Lecture: 3 Lab: - Exercises: 2 Total: 5

### **B - Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 2, 5, 11

#### **2. Contents:**

Introduction to analysis and design of modern analog electronic circuits, diode circuits, bipolar and field effect transistor circuits, transistor amplifier circuits and operational amplifier circuits

The opposition and mixed constants for high frequency amplifiers – intermediate and harmonic amplifiers – Bode plot and the frequency response – the harmonic vibrators – circuits of mixing and modification – power amplifiers.

#### **3. Teaching and Learning Methods**

3.1 - lecture 3.2 - Tutorial  
3.3 - practical training / lab

#### **4. Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## CEE 306 Electronic Tests 2

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 3, Semester:	2

### A. Basic Information:

Title: Electronic Tests 2 Code: CEE 306

Prerequisites: CEE 203

Credit hours: 3

Lecture: 1      Lab: 3      Exercises: -      Total: 4

### B – Professional Information:

#### 1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):

1, 2, 5, 11

#### 2. Contents:

way of use the wave plotter - the resonance circuits – trouble fixation of Zenner regulator – the use of the diode as a source – the luminous electronic equipments – the counters – the amplifiers and organizers of the integrated circuits – transistor (JFET type) – applications of the computer programming and computer organization.

#### 3. Teaching and Learning Methods

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### 4. Weighting of Assessments

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 401 Signals analysis**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: Electronics and Communications Eng.  
Department offering the course: Electronics and Communications Eng.  
Academic Level: 4, Semester: 1

### **A. Basic Information:**

Title: Signals analysis Code: CEE 401  
Prerequisites: -  
Credit hours: 3  
Lecture: 3 Lab: 0 Exercises: 2 Total: 5

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Representation of signals in the time and alternative range - the intermittent and continuous signals - the periodic signals - intermittent and continuous Fourier transfer - the spectral presentation – non periodic functions - samples and the spectral analysis – spectral power and energy

#### **3- Teaching and Learning Methods**

3.1 lecture 3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## **CEE 402 Electronic Circuits 2**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level:	4, Semester: 1

### **A- Basic Information:**

Title: Electronic Circuits 2	Code: CEE 402
Prerequisites: CEE 305	
Credit hours: 3	
Lecture: 3	Lab: -
Exercises: 2	Total: 5

### **B - Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 2, 5, 11

#### **2. Contents:**

The circuits of process amplifier –differential amplifiers – signals generators – volts organizers – the effective filters - the closing circuits – using the programming packages in the design and analysis of the electronic circuits.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 403 Integrated Circuits**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 4, Semester: 1	

### **A- Basic Information:**

Title: Integrated Circuits	Code: CEE 403
Prerequisites: CEE 305	
Credit hours: 3	
Lecture: 3	Lab: 0 Exercises: 2 Total: 5

### **B - Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 2, 5, 11

#### **2. Contents:**

Technology of the integrated circuits: implementation of the integrated circuits – the horizontal implementation and its economics - principles of design – Batt circuits metal/oxide/semiconductor/ the negative and the metal/semiconductor oxide/ synchronous. Gallium-Arsend digital circuits - applications of the digital and analog integrated circuits: transistor logic – transistor – connected transmitter logic – the digital circuits for metal/oxide/semiconductor - the widespread amplifiers and the transient conducting amplifiers - the radio frequency amplifiers and the medium frequency - the harmonic and non-harmonic pulses – the pulse which is controlled by volt – the closed stage ring – applications of the sending and he receiving circuits.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
-------------	--------------

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## **CEE 405 Optical semiconductors**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 4, Semester: 1	

### **A- Basic Information:**

Title: Optical semiconductors	Code: CEE 405		
Prerequisites: CEE 202			
Credit hours: 3			
Lecture: 3	Lab: 0	Exercises: 2	Total: 5

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1,5,11

#### **2. Contents:**

Fundamentals of light wave communication in optical fiber waveguides, physical description of fiber optic systems. Properties of optical fiber and fiber components. Electro-optic devices: light sources and modulators, detectors and amplifiers; optical transmitter and receiver systems. Fiber optic link design and specification; fiber optic networks.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 406 Microprocessor Systems**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 4, Semester: 2	

### **A- Basic Information:**

Title: Microprocessor Systems	Code: CEE 406		
Prerequisites: CEE 202			
Credit hours: 3			
Lecture: 3	Lab: 2	Exercises: -	Total: 5

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Theory and design of microprocessors – semiconductors technology – microprocessor architecture- microprocessor programming and interfacing- types of microprocessor- assembly language – software development – input/ output design – applications- interfacing- connection- memory components- support circuits – machine language and assembly language.

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 407 Electromagnetic Waves**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 4, Semester: 2	

### **A- Basic Information:**

Title: Electromagnetic Waves	Code: CEE 407		
Prerequisites: CEE 301			
Credit hours: 3			
Lecture: 3	Lab: -	Exercises: 2	Total: 5

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Maxwell Equations – Lorentz power low polarity –Pointing theory –Non electromagnetic waves – Maxwell equation static solutions –dipoles medium types – Polarized medium – homogeneous medium –plazma –boundary conditions – wave propagation in the different mediums - wave propagation in ideal and actual (with loss) materials – reflection and movement of waves on the flat surfaces – non vertical projection for plane waves in lossless medium.

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 408 Electronic tests 4**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: Electronics and Communications Eng.  
Department offering the course: Electronics and Communications Eng.  
Academic Level: 4, Semester: 2

### **A- Basic Information:**

Title: Electronic Tests 4 Code: CEE 408  
Prerequisites: CEE 402  
Credit hours: 3  
Lecture: 1 Lab: 3 Exercises: - Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 2, 5, 11

#### **2. Contents:**

Laboratory experiments in the field of electronic circuits include: optics analyzers, digital measuring devices – digital harmonic plotters – logical analyzers – The vibrators – the governed vibrators by the volt – the suddenly closing circuits – the harmonious amplifiers – the rates of the expansion and the retrievers. Laboratory experiments in the electronic circuits engineering, communications and fine and optical waves.

#### **3. Teaching and Learning Methods**

3.1 - lecture 3.2 - Tutorial  
3.3 - practical training / lab

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 411 Microwave electronics**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 4, Semester: 1	

### **A- Basic Information:**

Title: Microwave electronics	Code: CEE 411		
Prerequisites: CEE 402			
Credit hours: 3			
Lecture: 2	Lab: 0	Exercises: 2	Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Guidance for the rectangular and cylindrical waves – idle main components – the shell lines - microwaves transistors and amplifiers – low noise amplifiers – microwaves oscillators - idle surface components - the converters and the phase displacements.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## CEE 412 Advanced electronic measurements

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level:	4, Semester: 1

### A- Basic Information:

Title: Advanced electronic measurements Code: CEE 412

Prerequisites: CEE 202

Credit hours: 3

Lecture: 2                      Lab: 0                      Exercises: 2                      Total: 4

### B – Professional Information:

#### 1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):

1, 5, 11

#### 2. Contents:

Integrated measurements amplifiers – comparisons and taking of the samples and the stoping - the converters (digital/analog and analog/digital) - the electric variables - signals preparation and its filtration – idle elements – systems and components of signals attainments.

#### 3- Teaching and Learning Methods

3.1 lecture	3.2 Tutorial
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#### 4- Weighting of Assessments

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 413 Electronic design with aids of computer**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 4, Semester:	1

### **A- Basic Information:**

Title: Electronic design with aids of computer	Code: CEE 413
Prerequisites: CEE 204	
Credit hours: 3	
Lecture: 2	Lab: 0      Exercises: 2      Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

The electronic systems and the circulating standard components in electronic and communications - the design of the schemata and the printed circuits – the computer software packages in the electronic design – examples for the electronic design using these computer software packages.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## CEE 414 Fundamentals of Biomedical Engineering

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 4, Semester: 1	

### A- Basic Information:

Title: Fundamentals of Biomedical Engineering Code: CEE 414

Prerequisites: CEE 305, CEE 401

Credit hours: 3

Lecture: 2                      Lab: 0                      Exercises: 2                      Total: 4

### B – Professional Information:

#### 1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):

1, 5, 11

#### 2. Contents:

The safety and the insulations in the medical equipments - the manners of the noise deletion - the hearted helpful equipments – physiological measurements and the vital sensitivity - a processing of the vital signals and different photographic methods.

#### 3- Teaching and Learning Methods

3.1 lecture                      3.2 Tutorial

#### 4- Weighting of Assessments

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 415 Information systems**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 4, Semester: 2	

### **A- Basic Information:**

Title: Information systems	Code: CEE 415		
Prerequisites: ENG 205			
Credit hours: 3			
Lecture: 2	Lab: 0	Exercises: 2	Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Concepts of the information systems - components of the information systems - the functions of the information systems – organizing the function of information systems - the separate systems – manipulation of the commercial systems – systems of information management – decision support systems – expert systems – operating systems – office automation – implementation support systems – Data processing systems – files processing – data relationships – types of databases - relational databases - common databases – management systems - systems analysis - systems design – system manipulation – system maintenance

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 416 Telecommunications**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Minor  
Department offering the program: Electronics and Communications Eng.  
Department offering the course: Electronics and Communications Eng.  
Academic Level: 4, Semester: 2

### **A- Basic Information:**

Title: Telecommunications Code: CEE 416  
Prerequisites: CEE 401  
Credit hours: 3  
Lecture: 2 Lab: 0 Exercises: 2 Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Wireless telephony – Client circuits – Communication cables – Used tones –  
Telephony circuits - Communication methods - Electronic communication-  
Communication between cities.

#### **3- Teaching and Learning Methods**

3.1 lecture 3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 417 Computer circuits design**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 4, Semester: 2	

### **A- Basic Information:**

Title: Computer circuits design	Code: CEE 417
Prerequisites: CEE 402	
Credit hours: 3	
Lecture: 2	Lab: 0
Exercises: 2	Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Introduction to digital electronic - IC's fabrication technology- Binary circuit characteristics using transistors-logic gates families- types and characteristics, metal transistor gates- oxide -semiconductor and gates characteristics NMOS, CMOS, PMOS - regeneration digital logic circuits - flip-flops - schmit impulse -multi vibrator circuits - temporary ICS - semiconductor memory - ROM types ,static and dynamic writing - power sources and regulators - Energy loss Data Bus

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 418 Artificial intelligence**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 4, Semester: 2	

### **A- Basic Information:**

Title: Artificial intelligence	Code: CEE 418		
Prerequisites: ENG 305			
Credit hours: 3			
Lecture: 2	Lab: 0	Exercises: 2	Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2 Contents:**

Fundamental of artificial intelligent – random search – knowledge coding – Mathematical logic for knowledge - engineering and expert systems – Natural language processing – Knowledge representation – production system – Robots – Condensed introduction to programming using Lisp language and overall review for programming by Prolog language – programming applications in AI field focusing on: structure of customer accounting system including research operations, logical presentation, and decision making process in the uncertainty case - computer vision and neural networks.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
-------------	--------------

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 501 Signal processing**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 5, Semester: 1	

### **A- Basic Information:**

Title: Signal processing	Code: CEE 501		
Prerequisites: CEE 401			
Credit hours: 3			
Lecture: 3	Lab: 0	Exercises: 2	Total: 5

### **B – Professional Information:**

#### **1. Intended Learning Outcomes related to Program outcomes (ILOs):**

1, 5, 11

#### **2 Contents:**

Discrete time-signals and systems – Linear time-invariant systems and their properties – Sampling of continuous-time signals and convolution. IIR and FIR filter designs- Effects of finite word length- The discrete Fourier transform- Fast Fourier transform algorithms- Relations between Fourier Transform (FT)- Discrete-frequency FT (DFFT) or Fourier series, Discrete-time FT (DTFT), and Discrete FT (DFT: Discrete both time and frequency).

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## **CEE 502 Communication systems**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 5, Semester: 1	

### **A- Basic Information:**

Title: Communication systems	Code: CEE 502
Prerequisites: CEE 402	
Credit hours: 3	
Lecture: 3	Lab: 0      Exercises: 2      Total: 5

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2 Contents:**

Analog to digital converter - introduction to communication system - Analysis of analog and digital communication systems – types of analog and digital modulation – adaptive filters – receiver design – rate of binary error in channels – binary rate – symbol rate – sources types - Amplitude modulation - Amplitude demodulation - narrow band frequency modulation - phase modulation - phase and frequency demodulation - Amplitude and frequency modulated receivers - impulse modulation PAM, PWM, PPM - issues in modulation systems – the encrypted modulation – the differential encrypted modulation - the frequency and temporal division – the wide and frequent encryption

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 503 Communication networks**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: Electronics and Communications Eng.  
Department offering the course: Electronics and Communications Eng.  
Academic Level: 5, Semester: 1

### **A- Basic Information:**

Title: Communication networks Code: CEE 503  
Prerequisites: EEC 402  
Credit hours: 3  
Lecture: 3 Lab: - Exercises: 2 Total: 5

### **B - Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Concepts of communication Networks –basics of communications network design – network hierarchical – special structures in the global and wide and local networks - high-speed access control protocols - routing protocols, traffic management and network topologies – performance, modeling and simulation techniques.

#### **3. Teaching and Learning Methods**

3.1 - lecture 3.2 - Tutorial  
3.3 - practical training / lab

#### **4. Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 504 Digital Communications**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree.
Major or Minor element of program:	Major
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level:	5, Semester: 1

### **A- Basic Information:**

Title: Digital Communications	Code: CEE 504		
Prerequisites: CEE 402			
Credit hours: 3			
Lecture: 3	Lab: 0	Exercises: 2	Total: 5

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Analog pulse modulation: sampling theorem, PAM, PWM, PCM, delta modulation – Baseband transmission – TDM – Digital carrier modulation: ASK, PSK, FSK, - Error rate performance of digital modulation techniques: coherent receivers – non coherent receivers – channel coding – speed spectrum techniques.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 505 Luminous Communications**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 5, Semester: 1	

### **A- Basic Information:**

Title: Luminous Communications	Code: CEE 505
Prerequisites: CEE 402	
Credit hours: 3	
Lecture: 3	Lab: -
Exercises: 2	Total: 5

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

The physical principles and work of the light and laser emission joints – the luminous – The guidance and the fiber optics – ways and methods of the luminous communications – performance of the luminous connection ring.

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 506 Electronic tests 5**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Major  
Department offering the program: Electronics and Communications Eng.  
Department offering the course: Electronics and Communications Eng.  
Academic Level: 5, Semester: 2

### **A- Basic Information:**

Title: Electronic tests 5 Code: CEE 506  
Prerequisites: CEE 403  
Credit hours: 3  
Lecture: 1 Lab: 3 Exercises: - Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 2, 5, 11

#### **2. Contents:**

Laboratory experiments in the fields of: digital communication system – properties of closed phase ring – optical communication systems – television circuits properties – antennas, fine waves and micrometry circuits – integrated circuits.

#### **3. Teaching and Learning Methods**

3.1 - lecture 3.2 - Tutorial  
3.3 - practical training / lab

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 509 Project 1\***

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 5, Semester: 1	

### **A- Basic Information:**

Title: Project 1\* Code: CEE 509

Prerequisites: Completion of 144 CR

Credit hours: 3

Lecture: 2      Lab: 2      Exercises: -      Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14

#### **2. Contents:**

Students will be assigned projects in which they will be expected to apply Principles of Communications and Electronics Engineering, analysis and design to solve a given real world problem. Reports and presentations will be emphasized in addition to the technical content.

#### **3. Teaching and Learning Methods:**

- 3.1. Lectures,
- 3.2. Practical training/Lab
- 3.3 Industrial visits

#### **4- Weighting of Assessments**

Mid-Term Examination	0 %
Final Term Examination	0 %
Oral Examination	50 % at the end of IE 510
Practical Examination	0 %
Semester work	50 %
Other types	0 %
Total	100 %

\* Continuous Course; one oral examination for both IE 509 and IE 510 at the end of IE 510



## **CEE 510 Project 2\***

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 5, Semester: 2	

### **A- Basic Information:**

Title: Project 2*	Code: CEE 510		
Prerequisites: CEE 509			
Credit hours: 3			
Lecture: 2	Lab: 4	Exercises: -	Total: 6

### **B – Professional Information:**

#### **1- Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14

#### **2. Contents:**

Continuation and conclusion of the investigations on the communication or electronic problems of Project I; written reports and team presentations are required.

#### **3. Teaching and Learning Methods:**

- 3.1. Lectures,
- 3.2. Practical training/Lab
- 3.3 Industrial visits

#### **4- Weighting of Assessments**

Mid-Term Examination	0 %
Final Term Examination	0 %
Oral Examination	50 %
Practical Examination	0 %
Semester work	25 %
Report evaluation	25 %
Total	100 %

Continuous Course; one oral examination for both IE 509 and IE 510 at the end of IE510



## **CEE 511 Robotics Engineering**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 5, Semester:1	

### **A- Basic Information:**

Title: Robotics Engineering	Code: CEE 511
Prerequisites: MTH 202	
Credit hours: 3	
Lecture: 2	Lab: 0
Exercises: 2	Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Introduction in the theory and applications of robot - the space description of the robot - Robot mechanics and dynamics - The dynamic of robot motivators – the inverse motivators - the work of the motion path – kinematics and dynamics control of the robot (motion – force) – control of the motivators forces computer vision – robot programming languages – the fixed robot in the industrial sites – industrial applications.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## **CEE 512 Computer Engineering**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Minor  
Department offering the program: Electronics and Communications Eng.  
Department offering the course: Electronics and Communications Eng.  
Academic Level: 5, Semester: 1

### **A- Basic Information:**

Title: Computer Engineering Code: CEE 512  
Prerequisites: ENG 104  
Credit hours: 3  
Lecture: 2 Lab: 0 Exercises: 2 Total: 4

### **B - Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

The basics of the computer organization – computer instructions – processing unit – design of arithmetic logic units – Control unit – control by micro programs – memory organization –operating systems – time management – assumptions and the measurement of the goals – politics – space management – the levels of storage – address translation – the pages – the files – structures of the files – user interface – the orders translator – the helpful and reactive programs – the synchronization – basics of networks.

#### **3- Teaching and Learning Methods**

3.1 lecture 3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 513 Radar systems**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 5, Semester: 1	

### **A- Basic Information:**

Title: Radar systems	Code: CEE 513		
Prerequisites: CEE 416			
Credit hours: 3			
Lecture: 2	Lab: 0	Exercises: 2	Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

The basics and Types of the radar (pulse radar – Doppler – frequency formation) – the equipments of the sending and the reception – the antennas – hammer Land surveyor the radar – measurements of the range, angle and speed – analysis of the research signals and continuation methods – properties of the reflected signals from the goals –applications in the military and civil fields and the remote sensations.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## CEE 514 Neural networks

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 5, Semester:1	

### A- Basic Information:

Title: Neural networks	Code: CEE 514
Prerequisites: ENG 305	
Credit hours: 3	
Lecture: 2	Lab: 0
Exercises: 2	Total: 4

### B – Professional Information:

#### 1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):

1, 5, 11

#### 2. Contents:

Introduction to natural Neural structure – introduction to Artificial Neural Networks and parallel processing – Artificial Neural Networks main components – Neural Networks classification – supervised Neural Networks learning – self organizing learning – Neural Networks design – preprocessing data – network structure – learning Algorithms – artificial Neural Networks multilayer models – Hopfield model – Boltezman model - Neural Networks and expert systems – multilayer neural network applications

#### 3- Teaching and Learning Methods

3.1 lecture	3.2 Tutorial
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#### 4- Weighting of Assessments

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## CEE 515 Printed Circuit Design and Fabrication

### Course Specifications:

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 5, Semester: 1	

### A- Basic Information:

Title: Printed Circuit Design and Fabrication      Code: CEE 515

Prerequisites: CEE 406

Credit hours: 3

Lecture: 2      Lab: 0      Exercises: 2      Total: 4

### B – Professional Information:

#### 1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):

1, 5, 11

#### 2. Contents:

Printed Circuit Board (PCB) scales (size and types)- Surface treatments – Capacitors and coils for PCB connection – Spaces connection – Actual resources and earth's connectors- Components for positioning – Cooling requirements and Group density- Tests for surface- Design rules for different PCB and their applications: Digital, Analog, High frequency, and auto-technical. Programs for PCB design – PCB safety – Light printing – Silc-screen printing – Electronic board's fabrication – Auto-mechanical operations in PCB technology- Multi-layered boards – Technical methods for welding and assembly components.

#### 3- Teaching and Learning Methods

3.1 lecture      3.2 Tutorial

#### 4- Weighting of Assessments

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 516 Industrial Electronics**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 5, Semester: 1	

### **A. Basic Information:**

Title: Industrial Electronics	Code: CEE 516		
Prerequisites: CEE 204			
Credit hours: 3			
Lecture: 2	Lab: 0	Exercises: 2	Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

The usage of electronics in measurement equipments: Length and temperature – self waves and its usage in intelligence systems – circuit breakers and its usage in industry and traffic control – noise measurement system – different heating system using high frequency for conductive materials – sensitivity systems – loading systems – temperature recording and magnetic amplifiers – exhaust system analysis – control system for power system .

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 517 Introductions to VLSI Design**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 5, Semester: 2	

### **A- Basic Information:**

Title: Introduction to VLSI Design	Code: CEE 517		
Prerequisites: CEE 402			
Credit hours: 3			
Lecture: 2	Lab: 0	Exercises: 2	Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Design of VLSI circuits- Stick diagramming- NMOS transistors- Switch and gate Logic- PLAs- Finite-state machines- Design rules- CAD system- Speed and power considerations- Floor planning- Layout techniques- Fabrication of VLSI – Two basic MOS technologies and other available technologies- Oxidation- Photoengraving- Chemical etching diffusion.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 518 Satellite systems**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 5, Semester: 2	

### **A- Basic Information:**

Title: Satellite systems	Code: CEE 518		
Prerequisites: CEE 416			
Credit hours: 3			
Lecture: 2	Lab: 0	Exercises: 2	Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Introduction – considerations of the orbits – the joint of the radio frequency – the techniques of the modification – the elements of the satellite – elements of the land stations – technology of the numerous attainment – systems of Intel sat and DBS – the personal communications and the communications of the moving across the satellites.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 519 Mobile communications systems**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level:	5, Semester: 2

### **A. Basic Information:**

Title: Mobile communications systems	Code: CEE 519		
Prerequisites: CEE 416			
Credit hours: 3			
Lecture: 2	Lab: 0	Exercises: 2	Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Principles of cellular radio – Mobile radio propagation and channel modeling – Multiple access methods – Physical and Logical channels – Digital mobile communication systems: TDMA, GSM, CDMA, WCDMA - multi – carrier and OFDM systems.

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %





## **CEE 520 Antennas and wave propagation**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Major
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 2, Semester: 2	

### **A- Basic Information:**

Title: Antennas and wave propagation	Code: CEE 520		
Prerequisites: CEE 301, CEE 407			
Credit hours: 3			
Lecture: 2	Lab: 0	Exercises: 2	Total: 4

### **B - Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Basic definitions and theorems- Formulation of the radiation problems- Isotropic point source- Power and field patterns- Directivity and gain- Radiation impedance- Wave polarization- Radiation from current elements- Analysis and design of linear wire antenna- Linear array antenna- Uda-Yagi antenna- Log-periodic antenna- Aperture antenna- Antenna measurement techniques - Basic principles and analytical techniques of electromagnetic wave propagation- Transmission lines- Waveguides and resonators - Basic microwave networks- Scattering.

#### **3. Teaching and Learning Methods**

3.1 - lecture	3.2 - Tutorial
3.3 - practical training / lab	

#### **4. Weighting of Assessments**

Mid-Term Examination	10 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	10 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 521 Advanced electronic systems**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 5, Semester: 2	

### **A- Basic Information:**

Title: Advanced electronic systems	Code: CEE 521		
Prerequisites: CEE 402			
Credit hours: 3			
Lecture: 2	Lab: 0	Exercises: 2	Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Methods and ways of design and analysis of the digital and analogue electronic circuits – video and audio systems using the microwaves, satellites, the mobile technology and personal computer

#### **3- Teaching and Learning Methods**

3.1 lecture	3.2 Tutorial
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#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 522 Wireless networks and mobile systems**

### **Course Specifications:**

Program on which the course is given: Bachelor degree  
Major or Minor element of program: Minor  
Department offering the program: Electronics and Communications Eng.  
Department offering the course: Electronics and Communications Eng.  
Academic Level: 5, Semester: 2

### **A- Basic Information:**

Title: Wireless networks and mobile systems Code: CEE 522

Prerequisites: CEE 416

Credit hours: 3

Lecture: 2 Lab: 0 Exercises: 2 Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

Multidisciplinary, project-oriented design course that considers aspects of wireless and mobile systems including wireless networks and link protocols, mobile networking including support for the Internet Protocol suite, mobile middleware, and mobile applications. Students complete multiple experiments and design projects

#### **3- Teaching and Learning Methods**

3.1 lecture 3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %



## **CEE 523 Special Topics in Communication Engineering**

### **Course Specifications:**

Program on which the course is given:	Bachelor degree
Major or Minor element of program:	Minor
Department offering the program:	Electronics and Communications Eng.
Department offering the course:	Electronics and Communications Eng.
Academic Level: 5, Semester: 2	

### **A. Basic Information:**

Title: Special Topics in Communication Engineering      Code: CEE 523

Prerequisites: DEPT.

Credit hours: 3

Lecture: 2                      Lab: 0                      Exercises: 2                      Total: 4

### **B – Professional Information:**

#### **1. Intended Learning Outcomes of Course related to Program outcomes (ILOs):**

1, 5, 11

#### **2. Contents:**

A topic to be selected by the department to address new subjects in Communications Engineering.

#### **3- Teaching and Learning Methods**

3.1 lecture                      3.2 Tutorial

#### **4- Weighting of Assessments**

Mid-Term Examination	20 %
Final Term Examination	60 %
Oral Examination	0 %
Practical Examination	0 %
Semester work	20 %
Other types	0 %
Total	100 %

*Ministry of higher education  
Higher Institute for Engineering and Technology  
In New Damietta*

