

الهيئة العامة للتعليم التطبيقي والتدريب

كلية الدراسات التكنولوجية

قسم تكنولوجيا الهندسة الكيميائية



College of Technological Studies
Department of Chemical Engineering

Academic Programs

September 2018

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Programs Objectives

The programs:

- Associate degree in chemical engineering
- Bachelor of Science of Applied Technology in Chemical Engineering

aim to fulfill the needs of Kuwait national development plans with qualified and trained engineers/engineering technologists specialized to serve petroleum sectors, water desalination power plants, chemical and petrochemical industries sector. The programs also aim to enrich the applied knowledge and technical skills of students in various tracks of chemical engineering technology.

Workforce Market

The programs of the department of chemical engineering technology are committed to enable graduate professional engineers/engineering technologists to meet world-class standards and join public and private sectors of industry in current industrial operation and future projects. Among workforce markets are:

- KNPC.
- EQUATE and KOC.
- Ministry of Public Works, Ministry of Electricity and Water, and Public Authority for Environment Protection.
- Private Sector.

Program Inputs:

The programs of chemical industries technology and refinery operation technology admit high school certificate holders/scientific division while the Bachelor of science in applied Chemical Engineering technology program admits:

- Distinguished Associate degree graduates, and
- General High School Certificate holders/scientific division.

Vision and Mission

Vision

The department of Chemical Engineering Technology programs aim towards educating and training highly qualified professionals to join the national workforce required by the industrial sector in many technology streams to meet the following objectives:

- a) Offering a globally accredited program in nationally required chemical engineering technology tracks.
- b) Continuous development of programs to convoy with advancement in technology.
- c) Leading technological education in Kuwait in petroleum and industrial domains.
- d) Achieving a partnership with industrial sectors in the development of national economy.

Mission

The department of Chemical Engineering Technology programs offer support to national programs of social and economic development through technological through many professional programs directed towards the specific needs of workforce market in the following areas:

1. Petroleum Technology.
2. Chemical Processing Technology.
3. Water and Environment Technology.
4. Industrial Safety Technology.

Degree Offered

The three department programs offer the graduates:

- 1. Chemical Industries Technology Program:**
Associate Degree of Chemical Engineering Technology/Chemical Industries Technology.
- 2. Refinery Operation Technology Program:**
Associate Degree of Chemical Engineering Technology/Refinery Operation Technology

The associate degree programs are two and half year programs with total of 75 credit hours. Including one field training 18 hours term in which the student is supervised by engineers in real-world industrial environment and examined by department professors.

- 3. Chemical Engineering Technology Program:**
B. Sc. Degree of Applied Technology/ Chemical Engineering Technology

The Bachelor degree program has average duration of study of four years after high school certificate/Scientific Division or its equivalent. The program is co-operative with workforce markets through two field training courses in which the student is supervised by engineers in real-world industrial environment and examined by department professors. The program has four different technology tracks directed to serve workforce markets.

1. Petroleum Technology Track.
2. Chemical Processing Technology Track.
3. Water and Environment Technology Track.
4. Industrial Safety Technology Track.

برامج الدبلوم

Associate Degree in Chemical Industries Technology

دبلوم تكنولوجيا الصناعات الكيماوية

Program Outline



Diploma of Chemical Industries Technology

Department of Chemical Engineering Technology

College of Technological Studies

- Program: Chemical Industries Technology
- Duration: 2 and ½ Years
- Language of Instruction: English
- Degree Awarded: Associate Degree of Engineering Technology / Chemical Industries Technology.

PROGRAM DESCRIPTION

The program aims at giving the students the knowledge and technological skills that prepare them to:

- operate process equipment,
- think critically to solve problems,
- communicate clearly and effectively in speaking and writing, and
- demonstrate professional and ethical behavior.

ADMISSION REQUIREMENTS

1. Secondary high School Certificate or Equivalent (Science Major).
2. The student should pass any Entrance Examinations required by the College and the department of Chemical Engineering Technology.

PROGRAM OUTCOMES

On successful completion of the program the graduate will be able to:

- Apply knowledge, techniques, skills and modern tools of Chemical Process Technology to narrowly defined engineering technology activities.
- Apply knowledge of mathematics, science, engineering and technology to engineering technology problems that require limited application of principles but extensive practical knowledge.
- Conduct standard tests and measurements, and to conduct, analyze, and interpret experiments.
- Function effectively as a member of a technical team
- Identify, analyze and solve narrowly defined engineering technology problems.
- Apply written, oral and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature.
- Understand the need for and an ability to engage in self-directed continuing professional development.
- Understand and commit to address professional and ethical responsibilities, including a respect of diversity.
- Commit to quality, timeliness, and continuous improvement.

PROGRAM SUMMARY

Total Program Credit Hours	75 Credits
Social Science and Humanities	14 Credits
Mathematics	6 Credits
Natural Science	7 Credits
College Requirements	4 Credits
Chemical Engineering Technology	38 Credits
Field Training	6 Credits

SEMESTER OUTLINE

Semester 1

Subject	Credits
Math (1)	3
General Physics	3
Technical English	3
General Chemistry + General Chem. Lab	3
General elective	3
Total Credit Hours	15

Semester 2

Subject	Credits
Math (2)	3
Introduction to Computing	2
Technical Report Writing	3
Chemical Engineering Calculations	3
Communication Skills	3
Transport Phenomena	4
Total Credit Hours	18

Semester 3

Subject	Credits
Industrial Safety	2
Thermodynamics	3
Unit Operations	4
Reactor Technology	3
Quality Control	2
Islamic Culture	2
Total Credit Hours	16

Semester 4

Subject	Credits
Introduction to Env. Studies	2
Computer App. In ChE	2
Chemical Processes	4
Measurements and Control	3
Major Elective 1	3
Major Elective 2	3
Total Credit Hours	17

Semester 5

Subject	Credits
Field Training	6
Equipment Operation and Safety	3
Total Credit Hours	9

المخطط الفصلي

الفصل الثاني

وحدات	المقرر
3	رياضيات (2)
2	مقدمة في الحاسوب
3	كتابة تقارير فنية
3	حسابات الهندسة الكيميائية
3	مهارات التواصل
4	ظواهر الانتقال
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الفصل الأول

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3	رياضيات (1)
3	فيزياء عامة
3	انجليزي تقني
3	كيمياء عامة
3	اختياري عام
15	المجموع

الفصل الرابع

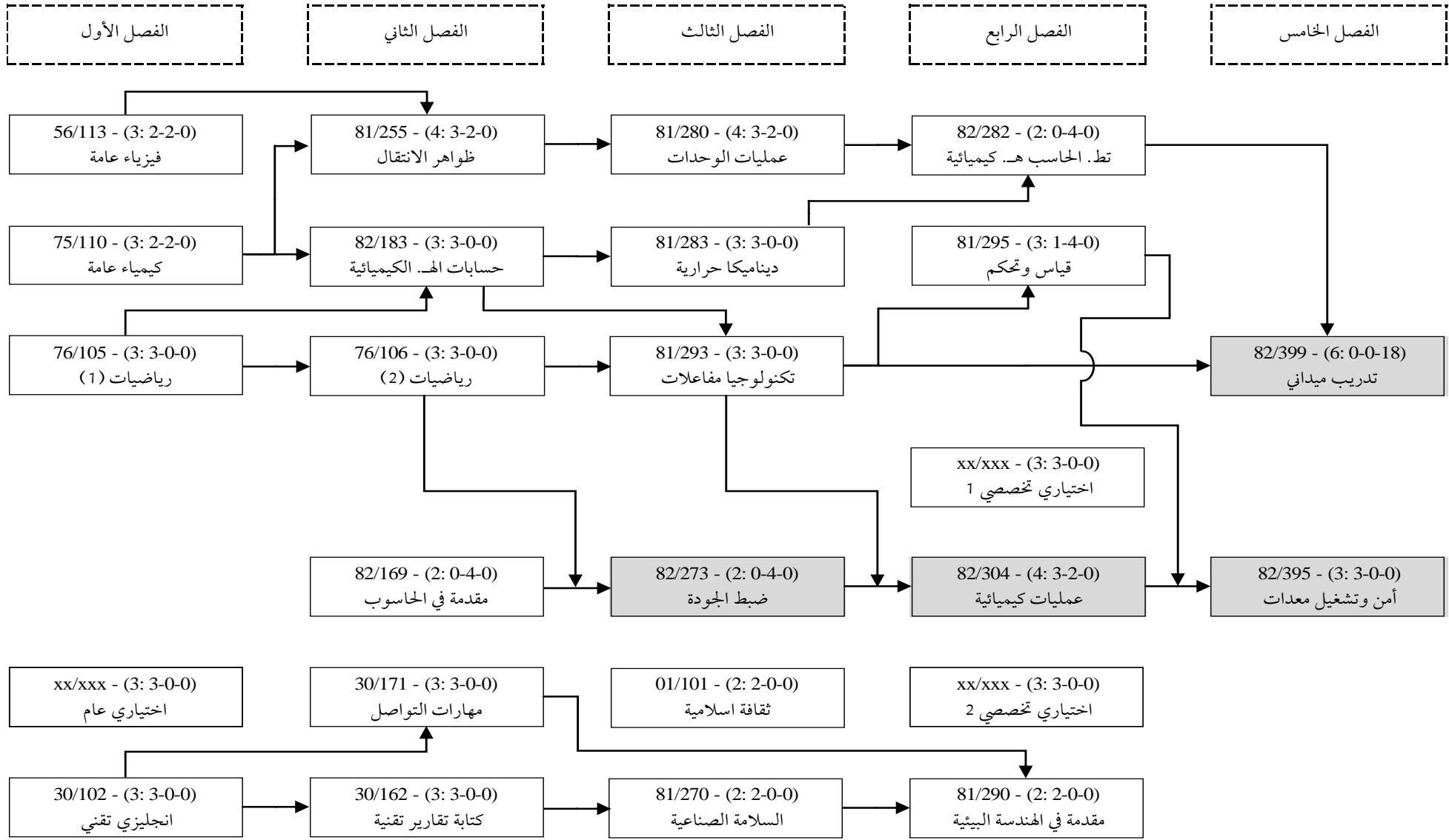
وحدات	المقرر
2	مقدمة في الهندسة البيئية
2	تطبيقات الحاسب في الهندسة الكيميائية
4	عمليات كيميائية
3	قياس وتحكم
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الفصل الثالث

وحدات	المقرر
3	السلامة الصناعية
3	ديناميكا حرارية
3	عمليات الوحدات
3	تكنولوجيا المفاعلات
2	ضبط الجودة
2	ثقافة اسلامية
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الفصل الخامس

وحدات	المقرر
6	تدريب ميداني
3	أمن وتشغيل معدات
9	المجموع



كلية الدراسات التكنولوجية

قسم تكنولوجيا الهندسة الكيميائية

تخصص : صناعات كيميائية

1. مقررات تخصصية اجبارية (42) وحدة

المطلب المسبق	ساعات			نظري	اسم المقرر	رقم المقرر	ن.س
	ميداني	عملي	نظري				
	0	2	2	3	كيمياء عامة	110	75
	0	4	0	2	مقدمة في الحاسوب	169	82
75/110, 56/113	0	2	3	4	ظواهر الانتقال	255	81
75/110, 76/105	0	0	3	3	حسابات الهندسة الكيميائية	183	82
82/183	0	0	3	3	ديناميكا حرارية	283	81
81/255	0	2	3	4	عمليات الوحدات	280	81
82/183, 76/106	0	0	3	3	تكنولوجيا المفاعلات	293	81
81/283, 81/280	0	4	0	2	تطبيقات الحاسب في الهندسة الكيميائية	282	82
81/293, 82/273	0	2	3	4	عمليات كيميائية	304	82
76/106, 82/169	0	4	0	2	ضبط الجودة	273	82
82/304, 81/295	0	0	3	3	أمن وتشغيل معدات	395	82
81/293	0	4	1	3	قياس وتحكم	295	81
81/293, 82/282	18	0	0	6	تدريب ميداني	399	82
	18	24	24	42	الاجمالي		

2. مقررات تخصصية اختيارية (6) وحدات

المطلب المسبق	ساعات			وحدات	اسم المقرر	رقم المقرر	ن.م.	
	ميداني	عملي	نظري					
81/293	0	0	3	3	تلوث الهواء	286	81	
82/183	0	0	3	3	هندسة البوليمرات	192	81	
82/183	0	0	3	3	نפט وغاز طبيعي	163	81	
81/283	0	0	3	3	ديناميكا حرارية للهندسة الكيميائية	285	82	
81/293	0	0	3	3	علم المواد الحفازة	288	81	
82/282	0	0	3	3	موضوعات في الهندسة الكيميائية	289	82	
82/282	0	0	3	3	حلول مثل	288	82	
82/183	0	0	3	3	حسابات هندسة كيميائية (2)	223	82	
82/273	0	0	3	3	معالجة المياه الصناعية	277	82	
82/273	0	0	3	3	تحلية المياه	278	82	
81/293	0	0	3	3	تآكل صناعي	264	82	
82/304	0	0	3	3	مشروع	305	82	
							الاجمالي	
	0	0	6	6				

3. مقررات عامة اجبارية (18) وحدة

المطلب المسبق	ساعات			وحدات	اسم المقرر	رقم المقرر	ن.م.	
	ميداني	عملي	نظري					
	0	0	3	3	رياضيات (1)	105	76	
76/105	0	0	3	3	رياضيات (2)	106	76	
	0	2	2	3	فيزياء عامة	113	56	
	0	0	3	3	انجليزي تقني	102	30	
30/102	0	0	3	3	كتابة تقارير فنية	162	30	
30/102	0	0	3	3	مهارات التواصل	171	30	
							الاجمالي	
	0	2	17	18				

4. مقررات اختيارية عامة (3) وحدات

المطلب المسبق	ساعات			وحدات	اسم المقرر	رقم المقرر	ن.م
	ميداني	عملي	نظري				
	0	0	3	3	قيم العمل والولاء	112	3
	0	0	2	1	تربية فنية (1)	141	7
07/ 141	0	0	2	1	تربية فنية (2)	142	7
	0	0	2	1	تربية رياضية	110	8
	0	0	2	1	بحث ومكتبات	104	10
	0	0	2	1	تربية موسيقية	151	13
	0	0	2	2	علم نفس صناعي	114	15
	0	0	2	2	محاسبة	164	21
	0	0	2	2	تأسيس وإدارة المشروعات الصغيرة	104	22
	0	0	2	2	اقتصاد صناعي	166	25
	0	0	3	3	مقدمة في العقود والمواصفات	102	57
	0	0	2	2	الابداع والتصميم في التكنولوجيا	268	64
	0	0	3	3	ميكانيكا السيارات	205	65
	0	0	3	3	حفظ المياه والطاقة	135	66
	0	0	3	3	الاجمالي		

5. مقررات عامة تكميلية (6) وحدات

المطلب المسبق	ساعات			وحدات	اسم المقرر	رقم المقرر	ن.م
	ميداني	عملي	نظري				
	0	0	2	2	ثقافة اسلامية	101	1
81/270, 30/171	0	0	2	2	مقدمة في الهندسة البيئية	290	81
30/162	0	0	2	2	السلامة الصناعية	270	81
	0	0	6	6	الاجمالي		

College of Technological Studies

Department of Chemical Engineering Technology

Major: Chemical Industries Technology

1. Compulsory Major Courses (42) Credits.

Code	Course #	Course Name	Cr	Hours			Pre-requisites
				T	L	F	
75	110	General Chemistry	3	2	2	0	
82	169	Introduction to Computers	2	0	4	0	
81	255	Transport Phenomena	4	3	2	0	75/110, 56/113
82	183	Chemical Eng. Calculations	3	3	0	0	75/110, 76/105
81	283	Thermodynamics	3	3	0	0	82/183
81	280	Unit Operations	4	3	2	0	81/255
81	293	Reactor Technology	3	3	0	0	82/183, 76/106
82	282	Computer App. in Chem.	2	0	4	0	81/283, 81/280
82	304	Chemical Processes	4	3	2	0	81/293, 82/273
82	273	Quality Control	2	0	4	0	76/106, 82/169
82	395	Equip. Oper. and Safety	3	3	0	0	82/304, 81/295
81	295	Measurements and Control	3	1	4	0	81/293
82	399	Field Training *	6	0	0	18	81/293, 82/282
Total			42	24	24	18	

2. Elective Major Courses (6) Credits.

Code	Course #	Course Name	Cr	Hours			Pre-requisites
				T	L	F	
81	286	Air Pollution	3	3	0	0	81/293
81	192	Polymer Engineering	3	3	0	0	82/183
81	163	Oil and Natural Gas	3	3	0	0	82/183
82	285	Chemical Eng Thermodyn	3	3	0	0	81/283
81	288	Catalysis	3	3	0	0	81/293
82	289	Topics in Chemical Eng.	3	3	0	0	82/282
82	288	Optimization	3	3	0	0	82/282
82	223	Chem. Eng. Calculations (2)	3	3	0	0	82/183
82	277	Wastewater treatment	3	3	0	0	82/273
82	278	Water Desalination	3	3	0	0	82/273
82	264	Industrial Corrosion	3	3	0	0	81/293
82	305	Project	3	3	0	0	82/304
Total			6	6	0	0	

3. Compulsory General Courses (18) Credits.

Code	Course #	Course Name	Cr	Hours			Pre-requisites
				T	L	F	
76	105	Mathematics (1)	3	3	0	0	
76	106	Mathematics (2)	3	3	0	0	76/105
56	113	General Physics	3	2	2	0	
30	102	Technical English	3	3	0	0	
30	162	Technical Report Writing	3	3	0	0	30/102
30	171	Communication Skills	3	3	0	0	30/102
Total			18	17	2	0	

4. Elective General Courses (3) Credits.

Code	Course #	Course Name	Cr	Hours			Pre-requisites
				T	L	F	
3	112	Work Ethics & Loyalty	3	3	0	0	
7	141	Art Education (1)	1	2	0	0	
7	142	Art Education (2)	1	2	0	0	07/ 141
8	110	Physical Education	1	2	0	0	
10	104	Research and Libraries	1	2	0	0	
13	151	Music Education	1	2	0	0	
15	114	Industrial Psychology	2	2	0	0	
21	164	Accounting	2	2	0	0	
22	104	Small Projects Est. & Man.	2	2	0	0	
25	166	Industrial Economics	2	2	0	0	
57	102	Intro. to Cont. & Spec's	3	3	0	0	
64	268	Creativity & Design in Tech	2	2	0	0	
65	205	Automobile Mechanics	3	3	0	0	
66	135	Energy & Water Conserv.	3	3	0	0	
Total			3	3	0	0	

5. Complementary General Courses (6) Credits.

Code	Course #	Course Name	Cr	Hours			Pre-requisites
				T	L	F	
1	101	Islamic Culture	2	2	0	0	
81	290	Introduction to Env. Studies	2	2	0	0	81/270, 30/171
81	270	Industrial Safety	2	2	0	0	30/162
Total			6	6	0	0	

Associate Degree in Refinery Operation Technology

دبلوم تكنولوجيا تشغيل المصافي

Program Outline



Diploma of Refinery Operation Technology

Department of Chemical Engineering Technology

College of Technological Studies

- Program: Refinery Operation Technology
- Duration: 2 and ½ Years
- Language of Instruction: English
- Degree Awarded: Associate Degree of Engineering Technology / Refinery Operation Technology.

PROGRAM DESCRIPTION

The program aims at giving the students the knowledge and technological skills that prepare them to:

- operate refinery equipment,
- think critically to solve problems,
- communicate clearly and effectively in speaking and writing, and
- demonstrate professional and ethical behavior.

ADMISSION REQUIREMENTS

3. Secondary high School Certificate or Equivalent (Science Major).
4. The student should pass any Entrance Examinations required by the College and the department of Chemical Engineering Technology.

PROGRAM OUTCOMES

On successful completion of the program the graduate will be able to:

- Apply knowledge, techniques, skills and modern tools of Refinery Process Technology to narrowly defined engineering technology activities.
- Apply knowledge of mathematics, science, engineering and technology to engineering technology problems that require limited application of principles but extensive practical knowledge.
- Conduct standard tests and measurements, and to conduct, analyze, and interpret experiments.
- Function effectively as a member of a technical team
- Identify, analyze and solve narrowly defined engineering technology problems.
- Apply written, oral and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature.
- Understand the need for and an ability to engage in self-directed continuing professional development.
- Understand and commit to address professional and ethical responsibilities, including a respect of diversity.
- Commit to quality, timeliness, and continuous improvement.

PROGRAM SUMMARY

Total Program Credit Hours	75 Credits
Social Science and Humanities	14 Credits
Mathematics	6 Credits
Natural Science	7 Credits
College Requirements	4 Credits
Chemical Engineering Technology	38 Credits
Field Training	6 Credits

SEMESTER OUTLINE

Semester 1

Subject	Credits
Math (1)	3
General Physics	3
Technical English	3
General Chemistry + General Chem. Lab	3
General elective	3
Total Credit Hours	15

Semester 2

Subject	Credits
Math (2)	3
Introduction to Computing	2
Technical Report Writing	3
Chemical Engineering Calculations	3
Communication Skills	3
Transport Phenomena	4
Total Credit Hours	18

Semester 3

Subject	Credits
Industrial Safety	2
Thermodynamics	3
Unit Operations	4
Reactor Technology	3
Petroleum Testing	2
Islamic Culture	2
Total Credit Hours	16

Semester 4

Subject	Credits
Introduction to Env. Studies	2
Computer App. In ChE	2
Petroleum Refining Processes	4
Measurements and Control	3
Major Elective 1	3
Major Elective 2	3
Total Credit Hours	17

Semester 5

Subject	Credits
Field Training	6
Refinery Equipment Operation and Safety	3
Total Credit Hours	9

المخطط الفصلي

الفصل الثاني

وحدات	المقرر
3	رياضيات (2)
2	مقدمة في الحاسوب
3	كتابة تقارير فنية
3	حسابات الهندسة الكيميائية
3	مهارات التواصل
4	ظواهر الانتقال
18	المجموع

الفصل الأول

وحدات	المقرر
3	رياضيات (1)
3	فيزياء عامة
3	انجليزي تقني
3	كيمياء عامة
3	اختياري عام
15	المجموع

الفصل الرابع

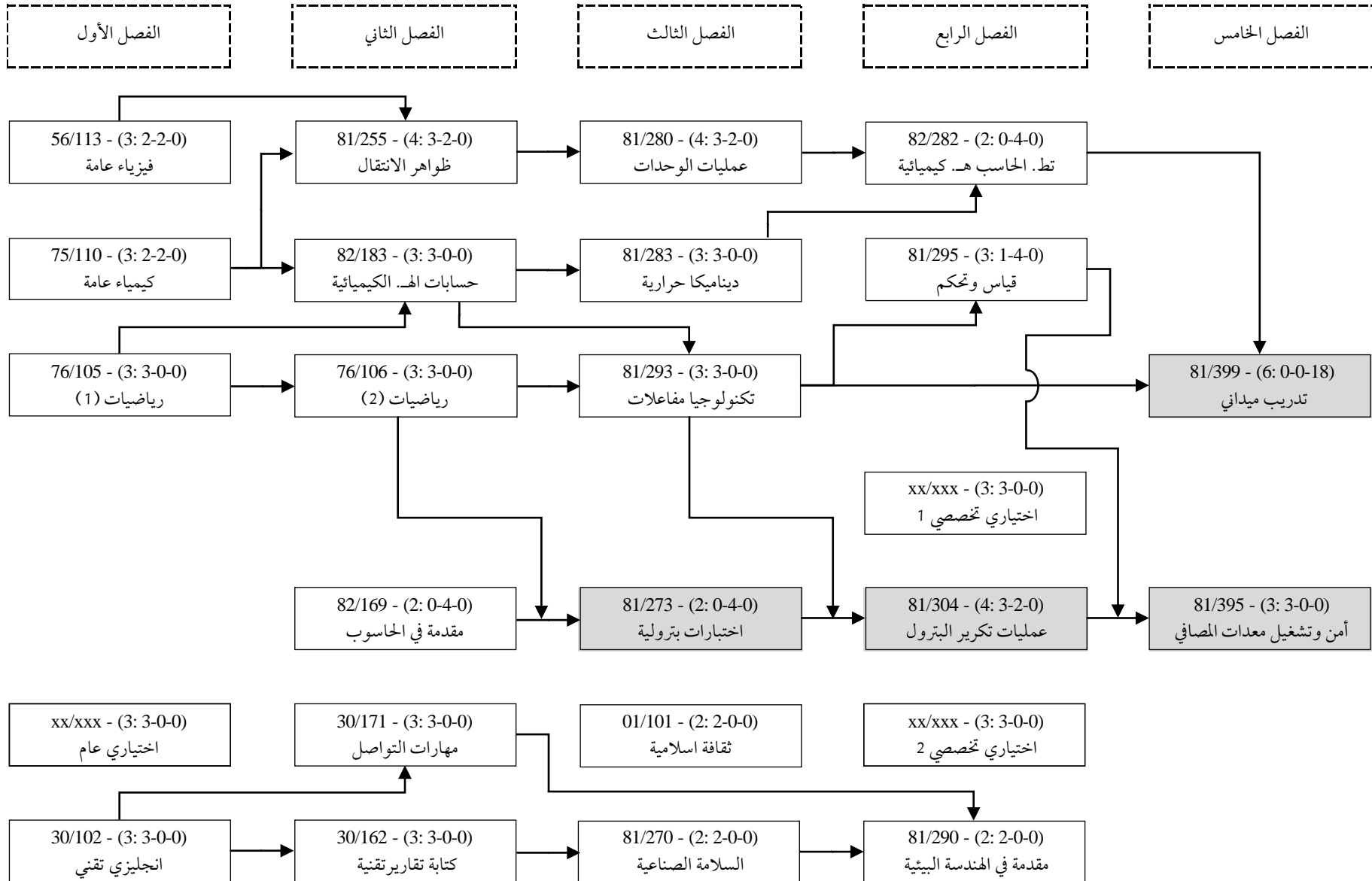
وحدات	المقرر
2	مقدمة في الهندسة البيئية
2	تطبيقات الحاسب في الهندسة الكيميائية
4	عمليات تكرير البترول
3	قياس وتحكم
3	اختياري تخصصي 1
3	اختياري تخصصي 2
17	المجموع

الفصل الثالث

وحدات	المقرر
3	السلامة الصناعية
3	ديناميكا حرارية
3	عمليات الوحدات
3	تكنولوجيا المفاعلات
2	اختبارات بترولية
2	ثقافة اسلامية
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الفصل الخامس

وحدات	المقرر
6	تدريب ميداني
3	أمن وتشغيل معدات المصافي
9	المجموع



كلية الدراسات التكنولوجية

قسم تكنولوجيا الهندسة الكيميائية

تخصص : تشغيل مصافي

1. مقررات تخصصية اجبارية (42) وحدة

المطلب المسبق	ساعات			نظري	اسم المقرر	رقم المقرر	ن.س
	ميداني	عملي	نظري				
	0	2	2	3	كيمياء عامة	110	75
	0	4	0	2	مقدمة في الحاسوب	169	82
75/110, 56/113	0	2	3	4	ظواهر الانتقال	255	81
75/110, 76/105	0	0	3	3	حسابات الهندسة الكيميائية	183	82
82/183	0	0	3	3	ديناميكا حرارية	283	81
81/255	0	2	3	4	عمليات الوحدات	280	81
82/183, 76/106	0	0	3	3	تكنولوجيا المفاعلات	293	81
81/283, 81/280	0	4	0	2	تطبيقات الحاسب في الهندسة الكيميائية	282	82
81/293, 81/273	0	2	3	4	عمليات تكرير البترول	304	81
76/106, 82/169	0	4	0	2	اختبارات بترولية	273	81
81/304, 81/295	0	0	3	3	أمن وتشغيل معدات المصافي	395	81
81/293	0	4	1	3	قياس وتحكم	295	81
81/293, 82/282	18	0	0	6	تدريب ميداني	399	81
	18	24	24	42	الاجمالي		

2. مقررات تخصصية اختيارية (6) وحدات

المطلب المسبق	ساعات			نظري	اجمالي	اسم المقرر	رقم المقرر	ن.س.
	ميداني	عملي	نظري					
81/293	0	0	3	3	تلوث الهواء	286	81	
82/183	0	0	3	3	هندسة البوليمرات	192	81	
82/183	0	0	3	3	نפט وغاز طبيعي	163	81	
81/283	0	0	3	3	ديناميكا حرارية للهندسة الكيميائية	285	82	
81/293	0	0	3	3	علم المواد الحفازة	288	81	
82/282	0	0	3	3	موضوعات في الهندسة الكيميائية	289	82	
82/282	0	0	3	3	حلول مثلي	288	82	
82/183	0	0	3	3	حسابات هندسة كيميائية (2)	223	82	
81/273	0	0	3	3	معالجة المياه الصناعية	277	82	
81/273	0	0	3	3	تحلية المياه	278	82	
81/293	0	0	3	3	تآكل صناعي	264	82	
81/304	0	0	3	3	مشروع	305	81	
								الاجمالي
	0	0	6	6				

3. مقررات عامة اجبارية (18) وحدة

المطلب المسبق	ساعات			نظري	اجمالي	اسم المقرر	رقم المقرر	ن.س.
	ميداني	عملي	نظري					
	0	0	3	3	رياضيات (1)	105	76	
76/105	0	0	3	3	رياضيات (2)	106	76	
	0	2	2	3	فيزياء عامة	113	56	
	0	0	3	3	انجليزي تقني	102	30	
30/102	0	0	3	3	كتابة تقارير فنية	162	30	
30/102	0	0	3	3	مهارات التواصل	171	30	
								الاجمالي
	0	2	17	18				

4. مقررات اختيارية عامة (3) وحدات

المطلب المسبق	ساعات			وحدات	اسم المقرر	رقم المقرر	ن.م
	ميداني	عملي	نظري				
	0	0	3	3	قيم العمل والولاء	112	3
	0	0	2	1	تربية فنية (1)	141	7
07/ 141	0	0	2	1	تربية فنية (2)	142	7
	0	0	2	1	تربية رياضية	110	8
	0	0	2	1	بحث ومكتبات	104	10
	0	0	2	1	تربية موسيقية	151	13
	0	0	2	2	علم نفس صناعي	114	15
	0	0	2	2	محاسبة	164	21
	0	0	2	2	تأسيس وإدارة المشروعات الصغيرة	104	22
	0	0	2	2	اقتصاد صناعي	166	25
	0	0	3	3	مقدمة في العقود والمواصفات	102	57
	0	0	2	2	الابداع والتصميم في التكنولوجيا	268	64
	0	0	3	3	ميكانيكا السيارات	205	65
	0	0	3	3	حفظ المياه والطاقة	135	66
	0	0	3	3	الاجمالي		

5. مقررات عامة تكميلية (6) وحدات

المطلب المسبق	ساعات			وحدات	اسم المقرر	رقم المقرر	ن.م
	ميداني	عملي	نظري				
	0	0	2	2	ثقافة اسلامية	101	1
81/270, 30/171	0	0	2	2	مقدمة في الهندسة البيئية	290	81
30/162	0	0	2	2	السلامة الصناعية	270	81
	0	0	6	6	الاجمالي		

College of Technological Studies

Department of Chemical Engineering Technology

Major: Chemical Industries Technology

1. Compulsory Major Courses (42) Credits.

Code	Course #	Course Name	Cr	Hours			Pre-requisites
				T	L	F	
75	110	General Chemistry	3	2	2	0	
82	169	Introduction to Computers	2	0	4	0	
81	255	Transport Phenomena	4	3	2	0	75/110, 56/113
82	183	Chemical Eng. Calculations	3	3	0	0	75/110, 76/105
81	283	Thermodynamics	3	3	0	0	82/183
81	280	Unit Operations	4	3	2	0	81/255
81	293	Reactor Technology	3	3	0	0	82/183, 76/106
82	282	Computer App. in Chem.	2	0	4	0	81/283, 81/280
81	304	Petroleum Refin. Processes	4	3	2	0	81/293,81/273
81	273	Petroleum Products Testing	2	0	4	0	76/106, 82/169
81	395	Refinery Eq. Oper. & Safety	3	3	0	0	81/304, 81/295
81	295	Measurements and Control	3	1	4	0	81/293
81	399	Field Training *	6	0	0	18	81/293, 82/282
Total			42	24	24	18	

2. Elective Major Courses (6) Credits.

Code	Course #	Course Name	Cr	Hours			Pre-requisites
				T	L	F	
81	286	Air Pollution	3	3	0	0	81/293
81	192	Polymer Engineering	3	3	0	0	82/183
81	163	Oil and Natural Gas	3	3	0	0	82/183
82	285	Chemical Eng Thermodyn	3	3	0	0	81/283
81	288	Catalysis	3	3	0	0	81/293
82	289	Topics in Chemical Eng.	3	3	0	0	82/282
82	288	Optimization	3	3	0	0	82/282
82	223	Chem. Eng. Calculations (2)	3	3	0	0	82/183
82	277	Wastewater treatment	3	3	0	0	81/273
82	278	Water Desalination	3	3	0	0	81/273
82	264	Industrial Corrosion	3	3	0	0	81/293
81	305	Project	3	3	0	0	81/304
Total			6	6	0	0	

3. Compulsory General Courses (18) Credits.

Code	Course #	Course Name	Cr	Hours			Pre-requisites
				T	L	F	
76	105	Mathematics (1)	3	3	0	0	
76	106	Mathematics (2)	3	3	0	0	76/105
56	113	General Physics	3	2	2	0	
30	102	Technical Report English	3	3	0	0	
30	162	Technical Writing	3	3	0	0	30/102
30	171	Communication Skills	3	3	0	0	30/102
Total			18	17	2	0	

4. Elective General Courses (3) Credits.

Code	Course #	Course Name	Cr	Hours			Pre-requisites
				T	L	F	
3	112	Work Ethics & Loyalty	3	3	0	0	
7	141	Art Education (1)	1	2	0	0	
7	142	Art Education (2)	1	2	0	0	07/ 141
8	110	Physical Education	1	2	0	0	
10	104	Research and Libraries	1	2	0	0	
13	151	Music Education	1	2	0	0	
15	114	Industrial Psychology	2	2	0	0	
21	164	Accounting	2	2	0	0	
22	104	Small Projects Est. & Man.	2	2	0	0	
25	166	Industrial Economics	2	2	0	0	
57	102	Intro. to Cont. & Spec's	3	3	0	0	
64	268	Creativity & Design in Tech	2	2	0	0	
65	205	Automobile Mechanics	3	3	0	0	
66	135	Energy & Water Conserv.	3	3	0	0	
Total			3	3	0	0	

5. Complementary General Courses (6) Credits.

Code	Course #	Course Name	Cr	Hours			Pre-requisites
				T	L	F	
1	101	Islamic Culture	2	2	0	0	
81	290	Introduction to Env. Studies	2	2	0	0	81/270, 30/171
81	270	Industrial Safety	2	2	0	0	30/162
Total			6	6	0	0	

Course Description

توصيف المقررات

75/110 General Chemistry

Credits: 3

Hours: 2-2-0

Introduction to the fundamental principles of chemistry, including the following: chemical stoichiometry; properties of gases, liquids, and solids; solutions; chemical equilibria; atomic and molecular structure; introduction to thermodynamics; and reaction kinetics. Laboratory experiments explore principles of general chemistry.

1. "Fundamental of Chemistry", David E. Goldberg, Wm. C. Brown Publisher.
2. "General Chemistry", Brady and Humiston, John Wiley and Sons.

82/169 Introduction to Computers

Credits: 2

Hours: 0-4-0

Operating systems and basic software applications in a windows-based environment; word processing; spreadsheets for solving systems of linear and nonlinear algebraic equations, plotting, fitting data, building new functions and making iterations and loops, Introduction to Matlab.

81/255 Transport Phenomena

Credits: 4

Hours: 3-2-0

Formulation of the physical laws of momentum, heat, and mass transport, with emphasis on their interrelationship. Application of these principles to basic transport processes. Diffusive and convective transport mechanisms, laboratory experiments investigate the principles and applications of transport laws.

1. Fundamentals of Momentum, Heat and Mass Transfer, J. Welty's, C. E. Wicks's, G. L. Rorrer's, R. E. Wilson's,
2. Transport Processes and Unit Operations, Christie J. Geankoplis,

82/183 Chemical Engineering Calculations

Credits: 3

Hours: 3-0-0

Basic Concepts and unit conversion; introduction to chemical engineering and chemical process industry; flow sheets fundamentals: units, concentrations, gasses and gas mixtures; steady state material and energy balances; introduction to unsteady state material and energy balance.

1. Basic Principles and Calculations in Chemical Engineering, David M. Himmelblau, James B. Riggs
2. Elementary Principles of Chemical Processes 3rd Update Edition by Richard M. Felder, Ronald W. Rousseau

81/283 Thermodynamics

Credits: 3

Hours: 3-0-0

Properties of pure substances: Phase diagrams, Property tables, equations of state; The first law of thermodynamics and applications for closed and open systems; The second and third law of thermodynamics and applications

1. Introduction to Chemical Engineering Thermodynamics, 7th Edition, by J.M. Smith, Hendrick C Van Ness, Michael Abbott
2. Thermodynamics: An Engineering Approach 8th Edition by Yunus Cengel, Michael Boles

81/280 Unit Operations

Credits: 4

Hours: 3-2-0

Fluid machinery, heat exchangers, condensers, evaporators; phase equilibria, binary and multi-components separations; equilibrium stage concept of process design for distillation and absorption; laboratory experiments investigate the principles and applications of separation processes.

1. Unit Operations of Chemical Engineering, Warren McCabe, Julian Smith, Peter Harriott,

81/293 Reactor Technology

Credits: 3

Hours: 3-0-0

Reaction equilibrium, reaction kinetics, interpretation of batch reactor data, ideal reactors, design for single and multiple reactions, isothermal and non-isothermal homogeneous reactions, and introduction to heterogeneous catalysis.

1. Elements of Chemical Reaction Engineering (4th Edition) 4th Edition by H. Scott Fogler
2. Chemical Reaction Engineering, 3rd Edition 3rd Edition by Octave Levenspiel

82/282 Computer Applications in Chemical Engineering

Credits: 2

Hours: 0-4-0

Numerical methods and applications to chemical engineering problems, and use of spreadsheets and applied math-related packages; process simulation programs such as HYSYS and ASPEN PLUS are used to simulate chemical process operations, including distillation columns, heat exchangers and reactors.

1. Numerical Methods for Engineers 7th Edition by Steven Chapra, Raymond Canale
2. Aspen HYSYS: An Introduction to Chemical Engineering Simulation: For Chemical Engineering Undergraduate Students by Mohd. Kamaruddin Abd. Hamid

82/304 Chemical Processes

Credits: 4

Hours: 3-2-0

Methodology of industrial chemical process, integration of fundamental chemical principles to industrial process, block flow diagram and process flow diagram, unit design and process evaluation using commercial process, applications on local industries; laboratory experiments investigate principles of physical chemistry, fluidization, and chemical reaction engineering

1. Chemical Process: Design and Integration 1st Edition by Robin Smith

82/273 Quality Control

Credits: 2

Hours: 0-4-0

Principle, role, management, and history of quality control in chemical industry; concepts, techniques, and procedures of quality control, preparation of statistical control charts and selection of suitable sampling plans; and fundamental concepts of reliability and experimental design.

1. Quality Control for Operators & Foremen by K. S. Krishnamoorthi

82/395 Equipment Operation & Safety

Credits: 3

Hours: 3-0-0

Main tasks of a chemical plant operator with a special emphasis on safety aspects of operation, including following safety regulations and using safety gear, operating rotary and stationary equipment, operating furnaces and boilers, monitoring operating conditions and troubleshooting, handling different types of chemicals safely, sampling process streams, preparing equipment for maintenance, and dealing with industrial equipment emergencies.

1. Handbook of Chemical Processing Equipment 1st Edition by Nicholas P Cheremisinoff Consulting Engineer

81/295 Measurements and Control

Credits: 3

Hours: 1-4-0

Concepts of process control, including dynamic modeling of processes, transfer functions, open loop response, feedback control, controllers and tuning methods, closed loop response, and stability analysis, Measurement and instrumentation and frequency-domain analysis of control systems. Laboratory experiments investigate open loop and closed loop dynamics, controller tuning, computer control, and simulation of chemical processes

1. Process Dynamics and Control 3rd Edition by Dale E. Seborg, Duncan A. Mellichamp, Thomas F. Edgar, Francis J. Doyle III

81/304 Petroleum Refining Processes

Credits: 4

Hours: 3-2-0

Crude oil properties, processes employed in petroleum refining operations, blending and other auxiliary processes, economics and optimization, environmental issues and regulations, laboratory experiments on crude oil characterization, and major refinery units and pilot plants.

1. Fundamentals of Petroleum Refining 1st Edition by Mohamed A. Fahim, Taher A. Al-Sahhaf, Amal Elkilani

81/273 Petroleum Products & Testing

Credits: 2

Hours: 0-4-0

Chemistry of petroleum products, sampling and labeling of gases, liquid hydrocarbon & water, ASTM specifications & evaluation of various types of petroleum products including Liquefied petroleum gas (LPG), naphtha, gasoline, kerosene, etc., Laboratory experiment on various test methods

1. Characterization and Properties of Petroleum Fractions by M.R. Riazi, M. R. Riazi

81/395 Refinery Equipment Operation & Safety

Credits: 3

Hours: 3-0-0

Main tasks of a petroleum refinery operator with a special emphasis on safety aspects of operation, including following safety regulations and using safety gear, operating rotary and stationary equipment, operating furnaces and boilers, monitoring operating conditions and troubleshooting, safe handling different types of chemicals, sampling process streams, preparing equipment for maintenance, and dealing with refinery equipment emergencies.

1. Handbook of Chemical Processing Equipment 1st Edition by Nicholas P Cheremisinoff Consulting Engineer
2. Fundamentals of Petroleum Refining 1st Edition by Mohamed A. Fahim, Taher A. Al-Sahhaf, Amal Elkilani

81/286 Air Pollution

Credits: 3

Hours: 3-0-0

Pollution types with emphasis on sources, cause, effects and general control methods; air pollution; air quality and emissions standards; plume and dispersion models; unit operations for control of gaseous and particulate pollutants; and monitoring techniques

1. Fundamentals of Air Pollution, Fifth Edition 5th Edition by Daniel Vallero
2. Air Quality, Fifth Edition 5th Edition by Thad Godish, Wayne T. Davis, Joshua S. Fu

81/192 Polymer Engineering

Credits: 3

Hours: 3-0-0

Introduction to Polymer Science, chemistry of polymers, chemical and physical properties of synthetic polymers, synthesis of monomers, sources of raw materials, flow charts of manufacture of polymers, and polymer processing.

1. Principles of Polymer Processing 2nd Edition by Zehev Tadmor, Costas G. Gogos
2. Introduction to Polymers, Third Edition 3rd Edition by Robert J. Young, Peter A. Lovell

81/163 Oil and Natural gas

Credits: 3

Hours: 3-0-0

Fundamentals of oil and gas exploration and production, reservoirs, discovery, fluid flow through porous media, principles of oil production performance, water flooding and enhanced oil recovery techniques, desalter operation, and gas and oil separation processes.

1. Oilfield Processing of Petroleum: Oilfield Processing, Vol. 2: Crude Oil by Francis Manning, Richard Thompson,

82/285 Chemical Engineering Thermodynamics

Credits: 3

Hours: 3-0-0

Review of first and second law of thermodynamics. Concepts of phase and reaction equilibria, excess properties, fugacities, activity coefficients, and models of non-ideal solutions; thermodynamics applied to chemical processes

1. Introduction to Chemical Engineering Thermodynamics, 7th Edition by J.M. Smith, Hendrick Van Ness, Michael Abbott

81/288 Catalysis

Credits: 3

Hours: 3-0-0

Concepts in catalyst preparation, catalyst characterization, and kinetic analysis of catalytic processes; principles and factors affecting reaction rates; application to industrial catalytic processes

1. Catalysis: From Principles to Applications 1st Edition by Matthias Beller, Albert Renken, Rutger A. van Santen

82/289 Topics in Chemical Engineering

Credits: 3

Hours: 3-0-0

Selected topics in chemical engineering technology and innovations in industrial chemical processes. The curriculum committee must preapprove the selected topic.

82/288 Optimization

Credits: 3

Hours: 3-0-0

Unconstrained optimization problems, linear programming problems, and nonlinear constrained optimization; Global search methods; elementary introduction to artificial neural networks, convex optimization, and multi-objective optimization; linear matrix inequalities.

1. An Introduction to Optimization 4th Edition by Edwin K. P. Chong, Stanislaw H. Zak

82/223 Chemical Engineering Calculations (2)

Credits: 3

Hours: 3-0-0

Single and multiphase systems; Review of the concept of energy and the first law of thermodynamics; Energy balances in non-reactive and reactive processes; Applications in simultaneous material and energy balances; Transient processes; introduction to process simulators; application on local industries.

1. Basic Principles and Calculations in Chemical Engineering, David M. Himmelblau, James B. Riggs
2. Elementary Principles of Chemical Processes 3rd Update Edition by Richard M. Felder, Ronald W. Rousseau

82/277 Wastewater Treatment

Credits: 3

Hours: 3-0-0

Essential concepts of wastewater treatment, as well as the engineering design of unit processes for the sustainable treatment of municipal wastewater.

1. Fundamentals of Wastewater Treatment and Engineering by Rumana Riffat

82/278 Water Desalination

Credits: 3

Hours: 3-0-0

Properties of water and aqueous solutions and engineering considerations; common methods of desalination such as multiple stage, flash distillation plant, vapor compression distillation, reverse osmosis, and electro-dialysis; pretreatment of seawater and post-treatment of desalted water.

1. Fundamentals of Salt Water Desalination by H. T. El-Dessouky

82/264 Industrial Corrosion

Credits: 3

Hours: 3-0-0

Fundamentals of corrosion and corrosion control relevant to the chemical industry. Differentiate between types of corrosion and importance of material selection. Corrosion prevention and protection methods; and Corrosion Economics.

1. Corrosion Engineering: Principles and Practice 1st Edition by Pierre Roberge

82/305 Project

Credits: 3

Hours: 3-0-0

Faculty-supervised term projects or research assigned to groups (minimum of 12 Students per class) on new or developing areas in chemical technology; a written report and oral presentation are required. The curriculum committee must preapprove the course proposal.

81/305 Project

Credits: 3

Hours: 3-0-0

Faculty-supervised term projects or research assigned to groups (minimum of 12 Students per class) on new or developing areas in refinery technology; a written report and oral presentation are required. The curriculum committee must preapprove the course proposal.

82/399 Field Training

Credits: 6

Hours: 0-0-18

Practical training for a period of 15 weeks (270 hours) in a chemical industrial facility, Emphasis is laid on reactive processing, control systems, equipment sizing, selection and operation, and safety and environment.

81/399 Field Training

Credits: 6

Hours: 0-0-18

Practical training for a period of 15 weeks (270 hours) in a petroleum refining facility, Emphasis is laid on reactive processing, control systems, equipment sizing, selection and operation, and safety and environment.

81/270 Industrial Safety

Credits: 2

Hours: 2-0-0

Overview of industrial safety and general causes of accidents; industrial hygiene and loss statistics; safety economics; classification of hazards; hazard identification and risk assessment, personal protective equipment, ergonomics and Work related Musculo-Skeletal Disorders (WMSD's)

1. Chemical Process Safety: Fundamentals with Applications, Daniel A. Crowl, Joseph F. Louvar,

81/290 Introduction to Environmental Engineering

Credits: 2

Hours: 2-0-0

Key concepts essential for understanding changes in the environment, understanding basic ecological patterns and processes, evaluating evidence about environmental changes, assessing the importance of such changes, and developing policy responses

1. Environmental Science and Engineering, , Gary W. Heinke,
2. Principles of Environmental Engineering & Science, Mackenzie Davis , Susan Masten,

Bachelor of Chemical Engineering Technology

بكالوريوس تكنولوجيا الهندسة الكيميائية

Program Outline

Bachelor of Chemical Engineering Technology

Department of Chemical Engineering Technology

College of Technological Studies



- Program: Chemical Engineering Technology
- Duration: 4 Years
- Language of Instruction: English
- Degree Awarded: Bachelor of Engineering Technology

PROGRAM DESCRIPTION

This program is designed to provide a quality education in Chemical Engineering Technology. The participants will gain knowledge in the principles and practice of Chemical Engineering Technology together with mathematics and science underlying these principles and they will be prepared to handle operation and design duties in the traditional technological areas of chemical engineering practice and related fields

ADMISSION REQUIREMENTS

5. Secondary high School Certificate or Equivalent (Science Major).
6. The student should pass any Entrance Examinations required by the College and the department of Chemical Engineering Technology.

PROGRAM OUTCOMES

On successful completion of the program the graduate will be able to:

1. Apply knowledge of mathematics, science and engineering to chemical engineering technology analysis
2. Conduct, analyze, and interpret experiments, and apply experimental results to improve processes
3. Design a system; component, or a process to meet the desired need
4. Analyze, formulate, and solve technical engineering technology problems
5. Acquire techniques, skills, and tools of modern engineering necessary for

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- engineering technology practice
6. Monitor operation of industrial rotary and stationary equipment, manage equipment maintenance, and apply safety regulations
 7. Communicate effectively in both written reports and oral presentations
 8. Function effectively within multi-disciplinary teams
 9. Empathize the impact of engineering technology solutions in a global, economic, environmental, and societal context
 10. Recognize the need for, and be able to engage in a life-long learning
 11. Combine engineering technology professional and ethical responsibility

PROGRAM SUMMARY

Total Program Credit Hours	132 Credits
Social Science and Humanities	21 Credits
Mathematics	12 Credits
Natural Science	12 Credits
College Requirements	21 Credits
Chemical Engineering Technology	60 Credits
Field Training	6 Credits

TECHNOLOGY TRACKS

The program is designed to provide graduates with knowledge and skills in one of four major technology tracks of chemical engineering technology:

1. Petroleum Technology.
2. Chemical Processing Technology.
3. Water and Environment Technology.
4. Industrial Safety Technology.

SEMESTER OUTLINE

Semester 1

Subject	Credits
Math (1)	3
Physics (1)	4
English (1)	3
General Chemistry + General Chem. Lab	4
Free elective	3
Total Credit Hours	17

Semester 2

Subject	Credits
Math (2)	3
Introduction to Computing	3
English (2)	3
Physics (2)	4
Organic Chemistry + Org. Chemistry Lab	4
Total Credit Hours	17

Semester 3

Subject	Credits
Applied Math for Engineers (1)	3
Introduction to Chemical Engineering Tech.	3
Analytical Chemistry + Analytic. Chem. Lab	4
Physical Chemistry + Physical Chem. Lab	4
Free Elective	3
Total Credit Hours	17

Semester 4

Subject	Credits
Applied Math for Engineers (2)	3
Transport Phenomena	3
Chemical Eng. Thermodynamics	3
Industrial Safety	2
Environmental Engineering	3
Unit Operations Laboratory (1)	2
Total Credit Hours	16

Summer Term

Subject	Credits
Field Training (1)	3
Total Credit Hours	3

Semester 5

Subject	Credits
Unit Operations	3
Technical Writing	3
Chemical Reaction Engineering	3
Technical Elective	3
Technical Elective	3
Equipment Operation and Safety	3
Total Credit Hours	18

SEMESTER OUTLINE (continued)

Semester 6

Subject	Credits
Computer App. In Chemical Engineering	3
Unit Operations Laboratory (2)	2
Technology Requirement (1)	3
Process Dynamics and Control	3
Process Dynamics and Control Laboratory	1
Equipment Sizing and Selection	3
Total Credit Hours	15

Semester 7

Subject	Credits
Field Training (2)	3
Islamic Culture	3
Engineering Elective	3
Engineering Elective	3
Free Elective	3
Total Credit Hours	15

Semester 8

Subject	Credits
Process Modeling, simulation, and Opti.	3
Technical elective	3
Technology Requirement (2)	3
Technology Requirement (3)	3
Work Ethics	2
Total Credit Hours	14

Extended Program Summary

0. Chemical Engineering (60 Credits)

Course #	Subject	Credits	Pre-requisite
CHE 151	Introduction to Chemical Engineering Technology	3	MTH 101, CHM 151
CHE 231	Physical Chemistry	3	CHM 101
CHE 232	Physical Chemistry Laboratory	1	CHE 231*
CHE 251	Transport Phenomenon	3	CHE 151, MTH 201
CHE 252	Unit Operations Laboratory (1)	2	CHE 251*
CHE 261	Chemical Engineering Thermodynamics	3	CHE 231, CHE 151
CHE 271	Computer Applications in Chemical Engineering	3	ENG 151, CHE 251
CHE 311	Equipment Operation and Safety	3	CHE 221, CHE 251
CHE 321	Chemical Reaction Engineering	3	CHE 251, CHE 261
CHE 331	Environmental Engineering	3	CHE 151
CHE 381	Unit Operations	3	CHE 251
CHE 382	Unit Operations Laboratory (2)	2	CHE 252, CHE 381*
CHE 391	Process Dynamics and Control	3	CHE 321
CHE 392	Process Dynamics and Control Laboratory	1	CHE 391*
CHE 402	Equipment Sizing and Selection	3	EN 201, CHE 381
CHE 451	Process Modeling, simulations, and Optimization	3	CHE 391, CHE 271
	Technical electives	9	
CHE 211	Material Science and Corrosion	3	CHM 101, CHE 151
CHE 461	Quality Control	3	MTH 202
CHE 463	Pharmaceutical Technology	3	CHE 381, CHM 151
CHE 467	Oil Upstream Operations	3	CHE 381
CHE 468	Biotechnology	3	CHE 321, CHE 381
CHE 469	Special Topics in Chemical Engineering Technology	3	CHE 402
CHE 471	Project in Chemical Engineering Technology	3	EN 201, CHE 401
CHE 492	Advanced Process Control	3	CHE 391
	Technology Requirements from Other Tracks	3	
	Technology Requirements from Other Tracks	3	
	Technology Requirements from Other Tracks	3	

* : Co-requisite

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Specialized Requirements (9 Credits)

Course #	Subject	Credits	Pre-requisite
Petroleum Technology Track			
CHE 403	Refining Processes	3	CHE 381
CHE 404	Refinery Products and Testing	3	CHE 301 *, CHM 241
CHE 411	Catalysis	3	CHE 321
Chemical Processing Technology Track			
CHE 405	Chemical Processes Technology	3	CHE 381
CHE 406	Polymer Technology	3	CHE 321
CHE 413	Separation and Mixing Processes	3	CHE 381, CHM 241
Water and Environment Technology Track			
CHE 407	Desalination and Water Technology	3	CHE 381
CHE 408	Wastewater Treatment	3	CHE 321
CHE 415	Pollution Management and Control	3	CHE 331, CHM 241
Industrial Safety Technology Track			
CHE 409	Hazard Recognition, Evaluation, and Control	3	CHE 311
CHE 410	Industrial Hygiene and Ergonomics	3	CHE 307, CHM 241
CHE 417	Safety personnel Duties	3	CHE 307
Total		60	

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Department of Chemical Engineering Technology

2. College Requirements (21 Credits)

The Student enrolled in chemical Engineering Technology program shall select 21 credits from the following engineering technology and applied science courses:

Course #	Subject	Credits	Pre-requisite
ENG 101	Engineering Drawing	2	
ENG 151	Introduction to Computing	3	MTH 101
CHE 221	Industrial Safety	2	EN 151
ENG 111	Statics	3	PHY 101
ENG 221	Electrical Circuits	3	PHY 102
ENG 131	Introduction to Engineering Technology	2	
CHM 151	Organic Chemistry + Organic Chemistry Lab	4	CHM 101
CHM 241	Analytical Chemistry + Analytical Chemistry Lab	4	CHM 101
PHY 201	Modern Physics	3	PHY 102
ENG 211	Numerical Analysis	3	MTH 202
ENG 201	Industrial Management	2	
ENG 231	Work Ethics	2	
	Total	21	

3. Social Science and Humanities (21 Credit Hours)

Course #	Subject	Credits	Pre-requisite
EN 101	English (1)	3	
EN 151	English (2)	3	ENG 101
EN 201	Technical Writing	3	ENG 151
	Free Electives	9	
IS 103	Islamic Culture	3	
	Total	21	

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4. Math Requirements (12 Credit Hours)

Course #	Subject	Credits	Pre-requisite
MTH 101	Math (1)	3	
MTH 102	Math (2)	3	MTH 101
MTH 201	Applied Math for Engineers (1)	3	MTH 102
MTH 202	Applied Math for Engineers (2)	3	MTH 201
	Total	12	

5. Natural Science Courses (12 Credit Hours)

Course #	Subject	Credits	Pre-requisite
PHY 101	Physics (1)	4	
CHM 101	General Chemistry	3	
CHM 105	General Chemistry Laboratory	1	CHM 101 *
PHY 102	Physics (2)	4	PHY 101
	Total	12	

* : Co-requisite

6. Field Training (6 Credit Hours)

Course #	Subject	Credits	Pre-requisite
CHE 291	Field Training (1)	3	CHE 251
CHE 401	Field Training (2)	3	CHE 291, CHE 391
	Total	6	

7. Pre-courses (0 Credit Hours)

Course #	Subject	Credits	Pre-requisite
MTH 095	Pre-Math	0	
CHM 096	Pre-Chemistry	0	
ENG 097	Pre-English	0	
	Total	0	

SUBJECTS ACCREDITED FOR DIPLOMA PROGRAM

Subject Accredited	Subject Equivalent	Credits
<u>General Requirement</u>		
Math (2)	Math (1)	3
General Chemistry	General Chemistry	3
English (1)	English (1)	3
Engineering Drawing	Engineering Drawing	2
Industrial Safety	Industrial Safety	2
Industrial Management	Industrial Management	2
Computers	Introduction to Computing	3
Free electives and others courses	Free Electives	9
<u>Major Subjects</u>		
Physical Chemistry	Physical Chemistry	3
Chemical Engineering Calculations	Introduction to Chemical Engineering Tech.	3
Field Training (2)	Field Training (1)	3
Fluid Mechanics, Heat transfer, and Mass Transfer	Transport Phenomena	3
Water Technology	Water Technology	3
Thermodynamics	Chemical Engineering Thermodynamics	3
Reactor Technology	Chemical Reaction Engineering	3
Equipment Operation and Safety	Equipment Operation and Safety	3
Process Measurements and Control	Process Dynamics and Control	3
<u>Technical Electives</u>		
Technical Electives and Major Courses	Technical Electives	9
Total Accredited Hours		63

Public Authority for Applied Education and Training

College of Technological Studies

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Extended Program; Semester Description

	Subject	Credits	Ch. Eng	College Requirements	Math	NS	HUM	TR
MTH 101	Math (1)	3			3			
PHY 101	Physics (1)	4				4		
EN 101	English (1)	3					3	
CHM 101	General Chemistry	3				3		
CHM 105	General Chemistry Laboratory	1				1		
	Free elective	3					3	
	Total Credits	17						
MTH 102	Math (2)	3			3			
ENG 151	Introduction to Computing	3		3				
EN 151	English (2)	3					3	
PHY 102	Physics (2)	4				4		
CHM 151	Organic Chemistry + Organic Chem. Lab	4		4				
	Total Credits	17						
MTH 201	Applied Math for Engineers (1)	3			3			
CHE 151	Introduction to Chemical Engineering Tech.	3	3					
CHE 241	Analytical Chemistry + Analytical Chem. Lab	4		4				
CHE 231	Physical Chemistry	3	3					
CHE 232	Physical Chemistry Laboratory	1	1					
	Free elective	3					3	
	Total Credits	17						
MTH 202	Applied Math for Engineers (2)	3			3			
CHE 251	Transport Phenomena	3	3					
CHE 261	Chemical Engineering Thermodynamics	3	3					
CHE 221	Industrial Safety	2		2				
CHE 331	Environmental Engineering	3	3					
CHE 342	Unit Operation Laboratory (1)	2	2					
	Total Credits	16						

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Extended Program; Semester Description (continued)

	Subject	Credits	Ch. Eng	College Requirements	Math	NS	HUM	TR
CHE 291	Field Training	3						3
	Total Credits	3						
CHE 381	Unit Operation	3	3					
EN 201	Technical Writing	3					3	
CHE 321	Chemical Reaction Engineering	3	3					
	Technical elective	3	3					
	Technical elective	3	3					
CHE 311	Equipment Operation and Safety	3	3					
	Total Credits	18						
CHE 271	Computer Applications in Chemical Engineering	3	3					
CHE 382	Unit Operation Laboratory (2)	2	2					
	Technology Requirement (1)	3	3					
CHE 391	Process Dynamics and Control	3	3					
CHE 392	Process Dynamics and Control Laboratory	1	1					
CHE 402	Equipment Sizing and Selection	3	3					
	Total Credits	15						
CHE 401	Field Training (2)	3						3
IS 103	Islamic Culture	3					3	
	Engineering Elective	3		3				
	Engineering Elective	3		3				
	Free elective	3					3	
	Total Credits	15						
CHE 451	Process Modeling, simulation, and Opti.	3	3					
	Technical elective	3	3					
	Technology Requirement (2)	3	3					
	Technology Requirement (3)	3	3					
	Work Ethics	2		2				
	Total Credits	14						
	Sum		60	21	12	12	21	6

Bachelor Courses Description

Public Authority for Applied Education and Training

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Bachelor of Engineering Technology

Chemical Engineering Technology

Course Description

Social Science and Humanities

EN 101 English (1)

Credits: 3

Skills in listening, speaking, reading, and writing, with a special emphasis on reading; development of reading skills; developing critical thinking; respond to ideas in a well-organized written format; reading-related writing skills

EN 151 English (2)

Credits: 3

Reinforcement of academic writing skills; writing of different types of essays based on the ideas they are exposed to in the reading selections; emphasis on the writing process from brainstorming and outlining to producing a complete documented piece of writing

Pre-requisite: EN 101

EN 201 Technical Writing

Credits: 3

Principles of organizing, developing, and writing technical information such as: preparation of project proposals and reports, professional oral presentation; report forms and rhetorical patterns common to scientific and technical disciplines; technical writing conventions; Numerous written assignments required

Pre-requisite: EN 151

IS 103 Islamic Culture

Credits: 3

The impact of Islam on Arabic culture, cultural meaning of Islamic rules, and tradition of early Islamic communities.

Mathematics

MTH 101 Math (1)

Credits: 3

Elementary analytic geometry, algebra, functions, limits of functions and continuity definition of derivatives and the techniques of differentiation; applications of the derivative; Anti-derivatives and indefinite integrals; definite integrals.

1. Calculus and Analytic Geometry for Engineering Technology, Bernard J. Rice, Jerry D. Strange, ISBN-13: 978-0534063788

MTH 102 Math (2)

Credits: 3

Definite integrals; applications and techniques of integration; logarithmic and exponential functions; inverse trigonometric and hyperbolic functions; improper integrals; infinite series

Pre-requisite: MTH 101

1. Calculus and Analytic Geometry for Engineering Technology, Bernard J. Rice, Jerry D. Strange, ISBN-13: 978-0534063788

MTH 201 Applied Math for Engineers (1)

Credits: 3

Ordinary differential equations; properties of special functions, solution methods including Laplace transforms, Fourier series, systems of linear differential equations, Partial differential equations with applications, introduction to optimization;

Pre-requisite: MTH 102

1. Ordinary Differential Equations: With Applications, Bernard J. Rice, Jerry D. Strange, ISBN-13: 978-0534213183
2. Elementary Linear Algebra, Howard Anton, ISBN-13: 978-0470458211

MTH 202 Applied Math for Engineers (2)

Credits: 3

Vector spaces, linear systems of equations, matrix operations, and linear transformations; statistics, linear regression and analysis of experimental data; probability distributions; complex variables

Pre-requisite: MTH 201

1. Applied Engineering Statistics, Robert M. Bethea, R. Russell Rhinehart, ISBN-13: 978-0824785031

Natural Science

PHY 101 Physics (1)

Credits: 4

Vectors; statics; uniform accelerated motion; energy; momentum; uniform circular motion; simple machines; elasticity, and simple harmonic motion; Laboratory experiments investigate the principles of elementary physics.

1. Physics for Engineering Technology, Jack Prince, David Sacher, ISBN-13: 978-0840356796

PHY 102 Physics (2)

Credits: 4

Electricity and magnetism, light, and modern physics; Laboratory experiments investigate the principles of electricity and Magnetism.

Pre-requisite: PHY 101

1. Technical College Physics, Jerry D. Wilson, ISBN-13: 978-0030738982
2. Fundamentals of Physics, David Halliday, Robert Resnick, Jearl Walker, ISBN-13: 978-0471216438

CHM 101 General Chemistry

Credits: 3

Introduction to the fundamental principles of chemistry, including chemical stoichiometry; properties of gasses, liquids, and solids; solutions; chemical equilibria; atomic and molecular structure; introduction to thermodynamics; reaction kinetics;

1. Chemistry for Engineering Students, Larry Brown, Tom Holme, ISBN-13: 978-1439047910

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CHM 105 General Chemistry Laboratory

Credits: 1

Laboratory experiments investigate the principles of general chemistry.

Co-requisite: CHM 101

College Requirements

ENG 101 Engineering Drawing

Credits: 2

An introductory course in the fundamentals of engineering drawing and the basics of Computer Aided Drawing (CAD). Manual drafting techniques are integrated with extensive use of AutoCAD. Topics include use of the drawing instruments, geometric construction, orthographic projection, technical sketching, sectional and auxiliary views and proper dimensioning techniques.

ENG 151 Introduction to Computing

Credits: 3

Operating systems and basic software applications in a windows-based environment; word processing; spreadsheets for solving systems of linear and nonlinear algebraic equations, plotting, fitting data, building new functions and making iterations and loops

Pre-requisite: MTH 101

CHE 221 Industrial Safety

Credits: 2

Overview of industrial safety and general causes of accidents; industrial hygiene and loss statistics; safety economics; classification of hazards; hazard identification and risk assessment, personal protective equipment, ergonomics and Work related Musculo-Skeletal Disorders (WMSD's)

Pre-requisite: EN 151

Chemical Process Safety: Fundamentals with Applications, Daniel A. Crowl,
Joseph F. Louvar,
ISBN-13: 978-0130181763

ENG 111 Statics

Credits: 3

Principles of mechanics force systems, equilibrium structures, distributed forces, centroids and friction.

Pre-requisite: PHY 101

ENG 221 Electrical Circuits

Credits: 3

Basic knowledge in Electrical Circuits, Electrical Variables, Basic electrical laws and elements, Electrical Power & Energy, Kirchhoff laws, Basic Circuit Analysis, basic electricity laws in DC and AC, RLC circuits, Power factor; Laboratory experiments investigate the principles of electrical circuits.

Pre-requisite: PHY 102

ENG 131 Introduction to Engineering Technology

Credits: 2

Engineering technology careers; technical laboratories and skills; solving engineering

problems; use of software programs and packages; overviews of industrial equipment; plant tours.

1. Introduction to Engineering Technology, Robert J. Pond, Jeffrey L. Rankinen, ISBN-13: 978-0135154304

CHM 151 Organic Chemistry

Credits: 4

Basic fundamentals of organic chemistry: including nomenclature, chemical and physical properties, reactions and syntheses of the major classes of organic compounds; Laboratory experiments investigates the principles of organic chemistry, Pre-requisite: CHM 101

1. Organic Chemistry, Robert T. Morrison, Robert N. Boyd, ISBN-13: 978-0136436690

CHM 241 Analytical Chemistry

Credits: 4

Chemical equilibrium; gravimetric analysis; titration; electrochemistry; spectroscopy and separations; instrumental methods of chemical analysis; evaluation of analytical data; Laboratory experiments investigates the principles of analytical chemistry Pre-requisite: CHM 101

1. Analytical Chemistry, Author: Gary D. Christian, ISBN-13: 978-8126511136

PHY 201 Modern Physics

Credits: 3

Wave–particle duality of electrons, blackbody radiation, Planck’s hypothesis, photoelectric effect, Compton effect, wave nature of matter, electron microscopes, atomic models, Bohr model, De Broglie hypothesis, quantum numbers, X-ray spectra, fluorescence and phosphorescence, lasers, bonding and banding in solids, and the structure and properties of the nucleus.

Pre-requisite: PHY 102

ENG 211 Numerical Analysis

Credits: 3

Basic numerical linear algebra; Solution of nonlinear equations; Interpolation and Approximation of polynomial and radial basis functions; Least squares; Numerical differentiation; Numerical integration; Runge-Kutta and multi-step methods for ODE initial value problems

Pre-requisite: MTH 202

1. Numerical Methods for Engineers ,Steven Chapra , Raymond Canale, ISBN-13: 978-0073401065

ENG 201 Industrial Management

Credits: 2

Various aspects of industrial management, including plant layouts and their apparatuses, organizational structure, required machines, tools and manpower. In addition, production quality and requirements are also emphasized. The issue of time and motion study, health and safety policies, and procedures.

ENG 231 Work Ethics

Credits: 2

Professional ethics, of moral issues which are important and relevant to engineers, including: the social responsibility of engineers; conflicts of interest; intellectual property issues; codes of conduct; corporate responsibility and the ethics of whistle-blowing; environmental issues; morally acceptable levels of risk; and the moral implications of technology.

1. Ethics in Engineering, Mike W. Martin, Roland Schinzinger, SBN-13: 978-0072831153

Chemical Engineering Technology

CHE 151 Introduction to Chemical Engineering Technology

Credits: 3

Basic Concepts and unit conversion; introduction to chemical engineering and chemical process industry; flow sheets fundamentals: units, concentrations, gasses and gas mixtures; steady state material and energy balances; introduction to unsteady state material and energy balance

Pre-requisite: MTH 101, CHM 151

1. Basic Principles and Calculations in Chemical Engineering, David M. Himmelblau, James B. Riggs, ISBN-13: 978-0131406346
2. Elementary Principles of Chemical Processes 3rd Update Edition Edition by Richard M. Felder (Author), Ronald W. Rousseau (Author) ISBN-13: 978-0471687573

CHE 231 Physical Chemistry

Credits: 3

Properties of pure substances: Phase diagrams, Property tables, equations of state; The first law of thermodynamics and applications for closed and open systems; The second and third law of thermodynamics and applications; chemical reaction equilibria,

Pre-requisite: CHM 101

1. Introduction to Chemical Engineering Thermodynamics, 7th Edition, by J.M. Smith, Hendrick C Van Ness, Michael Abbott ISBN-13: 978-0073104454
2. Applied Thermodynamics for Engineering Technologists, , A. Mcconkey, ISBN-13: 978-0582091931

CHE 232 Physical Chemistry Laboratory

Credits: 1

Laboratory experiments investigates the principles of physical chemistry, Co-requisite: CHE 231

CHE 251 Transport Phenomena

Credits: 3

Formulation of the physical laws of momentum, heat, and mass transport, with emphasis on their interrelationship. Application of these principles to basic transport processes. Diffusive and convective transport mechanisms.

Pre-requisite: CHE 151, MTH 201

1. Fundamentals of Momentum, Heat and Mass Transfer, J.Welty's, C. E. Wicks's, G. L. Rorrer's, R. E. Wilson' s, ASIN: B01KORNSN8
2. Transport Processes and Unit Operations, Christie J. Geankoplis, ISBN-13: 978-0139304392

CHE 252 Unit Operations Laboratory (1)

Credits: 2

Laboratory studies demonstrating principles of fluid mechanics and heat transfer. Emphasis is on laboratory safety, correlation of experimental results and on written reports and oral presentation

Co-requisite: CHE 251

CHE 261 Chemical Engineering Thermodynamics

Credits: 3

Review of first and second law of thermodynamics. Concepts of phase and reaction equilibria, excess properties, fugacities, activity coefficients, and models of non-ideal solutions; thermodynamics applied to chemical processes

Pre-requisite: CHE 231, CHE 151

1. Introduction to Chemical Engineering Thermodynamics,7th Edition, by J.M. Smith, Hendrick C Van Ness, Michael Abbott ISBN-13: 978-0073104454

CHE 271 Computer Applications in Chemical Engineering

Credits: 3

Numerical methods and applications to chemical engineering problems; Lagrange interpolation; integration; numerical solution of ordinary differential equations; boundary value problems, and systems of differential equations; introduction to numerical solutions of partial differential equations; emphasis on the use of spreadsheets, Matlab, and Mathcad

Pre-requisite: ENG 151, CHE 251

1. Problem Solving in Chemical and Biochemical Engineering with POLYMATH, Excel, and MATLAB, , MordechaiShacham, ISBN-13: 978-0131482043

CHE 311 Equipment Operation and Safety

Credits: 3

Main tasks of a chemical plant engineer: industrial application of major equipment; practical information on the working principles and engineering basis for major equipment, monitoring operating conditions and troubleshooting, following safety regulations and using safety gear, , managing startups and shutdowns, equipment maintenance, dealing with chemical process equipment emergencies; special emphasis on safety aspects of operation

Pre-requisite: CHE 221, CHE 251

1. Handbook of Chemical Processing Equipment, Nicholas P Cheremisinoff, ISBN-13: 978-0750671262
2. Chemical Process Safety: Learning from Case Histories, Roy E. Sanders, ISBN-13: 978-0750677493

CHE 321 Chemical Reaction Engineering

Credits: 3

Reaction equilibrium, reaction kinetics, interpretation of batch reactor data, ideal reactors, design for single and multiple reactions, isothermal and non-isothermal homogeneous reactions; introduction to heterogeneous catalysis

Pre-requisite: CHE 251, CHE 261

1. Chemical Reaction Engineering, 3rd Edition by Octave Levenspiel
ISBN-13: 978-0471254249

CHE 331 Environmental Engineering

Credits: 3

Fundamental principles in environmental engineering; chemical principles for separation, processing and technologies used for treating and recovery of wastes; qualitative and quantitative analysis and treatment of environmental problems; environmental legislations

Pre-requisite: CHE 151

1. Environmental Technology in the Oil Industry, Stefan T. Orszulik,
ISBN-13: 978-9048173761
2. Environmental Science and Engineering, , Gary W. Heinke,
ISBN-13: 978-0131206502
3. Principles of Environmental Engineering & Science, Mackenzie Davis , Susan Masten,
ISBN-13: 978-0073122359

CHE 381 Unit Operations

Credits: 3

Fluid machinery, heat exchangers, condensers, evaporators; phase equilibria, binary and multi-components separations; equilibrium stage concept of process design for distillation and absorption

Pre-requisite: CHE 251

1. Unit Operations of Chemical Engineering, Warren McCabe, Julian Smith, Peter Harriott,
ISBN-13: 978-0072848236

CHE 382 Unit Operations Laboratory (2)

Credits: 2

Intensive laboratory experiments illustrate the application of chemical and physical principles to chemical process; emphasis is given to mass transfer, simultaneous heat and mass transfer and chemical kinetics

Pre-requisite: CHE 252, Co-requisite: CHE 381

CHE 391 Process Dynamics and Control

Credits: 3

Concepts of process control, including: dynamic modeling of processes, transfer functions, open loop response, feedback control, controllers and tuning methods, closed loop response, stability analysis, Measurement and instrumentation, frequency-domain

Pre-requisite: CHE 321

1. Process Dynamics and Control, 4e by Dale E. Seborg, Thomas F. Edgar, Duncan A. Mellichamp, Francis J. Doyle
ISBN-13: 978-1119385561

CHE 392 Process Dynamics and Control Laboratory

Credits: 1

Applications of fundamental principles of the dynamics and control of chemical processes including open-loop and closed-loop dynamics; controller tuning, computer control, and simulation of chemical processes

Co-requisite: CHE 391

CHE 402 Equipment Sizing and Selection

Credits: 3

Introduction to practical engineering methods for specifying or selecting type of equipment used in chemical industry such as; piping systems, control valves, pumps, compressors, heat exchangers, towers, mixers, reactors, storage tanks, etc; materials of constructions; economics

Pre-requisite: EN 201, CHE 381

1. Chemical Process Equipment: Selection and Design, James R. Couper , W. Roy Penney , James R. Fair , Stanley M. Walas,
ISBN-13: 978-0123725066

CHE 451 Process Modeling, Simulation, and Optimization

Credits: 3

Mathematical model formulation of chemical and physical processes; use of process simulators; optimization concepts; types of optimization problems and solution techniques

Pre-requisite: CHE 391, CHE 271

1. Mathematical Modeling in Chemical Engineering 1st Edition by Anders Rasmuson, Bengt Andersson, Louise Olsson, Ronnie Andersson
ISBN-13: 978-1107049697
2. Optimization of Chemical Processes, , David M. Himmelblau,
ISBN-13: 978-0071189774

Technology Requirements

Petroleum Technology Track

CHE 403 Refining Processes

Credits: 3

Crude oil properties; processes employed in petroleum refining operations; blending and other auxiliary processes; economics and optimization; environmental issues and regulations; laboratory experiments on crude oil characterization and major refinery units pilot plants, Laboratory experiments investigates the principles of petroleum refining

Pre-requisite: CHE 381

1. Fundamentals of Petroleum Refining 1st Edition by Mohamed A. Fahim, Taher A. Al-Sahhaf, Amal Elkilani
ISBN-13: 978-0444527851
2. Petroleum Refining: Technology and Economics, , Glenn E. Handwerk, Mark J. Kaiser,
ISBN-13: 978-0849370380

CHE 404 Refinery Products and Testing

Credits: 3

Chemistry of petroleum products, sampling and labeling; ASTM specifications & evaluation of various types of petroleum products, blending; Laboratory experiment on various test methods, Laboratory experiments investigates the principles of petroleum products testing

Pre-requisite: CHM 241, Co-requisite: CHE 301

1. Characterization and Properties of Petroleum Fractions by M.R. Riazi, M. R. Riazi
ISBN-13: 978-0803133617
2. Handbook of Petroleum Product Analysis, James G. Speight,
ISBN-13: 978-0471203469

CHE 411 Catalysis

Credits: 3

Concepts in catalyst preparation, catalyst characterization, and kinetic analysis of catalytic processes; principles and factors affecting reaction rates; application to industrial catalytic processes

Pre-requisite: CHE 321

1. Heterogeneous Catalysis in Industrial Practice,
ISBN-13: 978-0070548862
2. Chemistry of Catalytic Processes,
ISBN-13: 978-0070229877

Chemical Processing Technology Track

CHE 405 Chemical Processes Technology

Credits: 3

Material and energy balances for chemical processes; unit design and process evaluation; applications on local industries, Laboratory experiments investigates the principles of chemical processes.

Pre-requisite: CHE 381

1. Chemical Process Technology, Jacob A. Moulijn, MichielMakkee, Annelies van Diepen,
ISBN-13: 978-0471630623

CHE 406 Polymer Technology

Credits: 3

Introduction to Polymer Science; chemistry of polymers; chemical and physical properties of synthetic polymers; polymerization reactions; manufacture of polymers and composite materials

Pre-requisite: CHE 321

1. Polymer Processing and Structure Development, Arthur N. Wilkinson, A.J. Ryan, Anthony J. Ryan,
ISBN-13: 978-0792357728

CHE 413 Separation and mixing Processes

Credits: 3

Fundamental principles and design of separation processes; batch and continuous flow; plate and packed towers; distillation, absorption, stripping, and extraction; fundamentals of mixing; operation, evaluation, and optimization; Laboratory experiments investigates the principles of separation and mixing processes

Pre-requisite: CHE 381, CHM 241

1. Separation Process Principles, , Ernest J. Henley,
ISBN-13: 978-0471464808
2. Mixing in the Process Industries, A W NIENOW, M F EDWARDS, N. Harnby,
ISBN-13: 978-0750637602

Water and Environment Technology Track

CHE 407 Desalination and water technology

Credits: 3

Properties of seawater; common methods of desalination; multiple stage flash desalination, vapor compression distillation, reverse osmosis, and electro-dialysis; pretreatment of sea water and post treatment of desalted water; introduction to industrial wastewater treatment; Laboratory experiments investigates the principles of water technology

Pre-requisite: CHE 381

1. Fundamentals of Salt Water Desalination, H.T. El-Dessouky, H.M. Ettouney,
ISBN-13: 978-0444508102

CHE 408 Wastewater Treatment

Credits: 3

Introduction to wastewater treatment methods and technology, physical, chemical, and biological treatment; operation of equipment used in wastewater treatment; Laboratory experiments investigates the principles of wastewater treatment.

Pre-requisite: CHE 321

1. Wastewater Engineering: Treatment and Reuse, George Tchobanoglous, Franklin L. Burton, H. David Stensel,
ISBN-13: 978-0070418783
2. Water Treatment: Principles and Design, MWH,
ISBN-13: 978-0471110187

CHE 415 Pollution Management and Control

Credits: 3

Study of all pollution from industries, with emphasis on sources, cause, effects and general control methods; air pollution; air quality and emissions standards; plume and dispersion models; unit operations for control of gaseous and particulate pollutants; monitoring techniques

Pre-requisite: CHE 331, CHM 241

1. Air Pollution: Measurement, Modelling and Mitigation, Jeremy Colls, Abhishek Tiwary, ISBN-13: 978-0415479325
2. Water Supply and Pollution Control, Warren Viessman Jr., Mark J. Hammer, Elizabeth M. Perez, Paul A. Chadik, ISBN-13: 978-0132337175

Industrial Safety Technology Track

CHE 409 Hazard Recognition, Evaluation, and Control

Credits: 3

Risk Management Programs; Screening Analysis Techniques; Checklist Reviews; Preliminary Hazard Analysis; Safety Audits; WHAT-IF Analysis; Failure Modes and Effects Analysis; Hazard and Operability Studies; Fault Tree and Event Tree Analysis; Specific Hazard Analyses; Quantified Risk Assessment; Human Reliability; Training; Emergency Preparedness; and Hazard controls.

Pre-requisite: CHE 311

1. Industrial Hygiene Simplified: A Guide to Anticipation, Recognition, Evaluation, and Control of Workplace Hazards, Frank R. Spellman, ISBN-13: 978-0865870192

CHE 410 Industrial Hygiene and Ergonomics

Credits: 3

Fundamentals of industrial hygiene and ergonomics; chemical hazards; Epidemiology; Toxicology; Physical hazards; Biohazards; The industrial hygiene survey; Injury & illness prevention programs; Ergonomics; Ergonomic risk factors; Ergonomic worksite programs

Pre-requisite: CHE 307, CHM 241

1. Introduction to Ergonomics, R.S. Bridger, ISBN-13: 978-0849373060
2. Ergonomics for Beginners: A Quick Reference Guide, Jan Dul, Bernard Weerdmeester, ISBN-13: 978-1420077513

CHE 417 Safety Personnel Duties

Credits: 3

Appraising plant safety and setting priorities, Inspection/Auditing, Incident/Accident investigation, Emergency response, Safety training program, and implementing safety regulations (Hazard communication, preventive maintenance programs, Injury/illness record keeping, Lockout/Tagout procedures, Cold/Hot work permits)

Pre-requisite: CHE 307

1. Occupational Safety and Health for Technologists, Engineers, and Managers, David L. Goetsch, ISBN-13: 978-0137009169

Technical Electives

CHE 211 Material Science and Corrosion

Credits: 3

Fundamentals; atomic structure, atomic arrangement, atomic imperfections, mechanical properties, processing and concept of engineering design of materials; electrochemical basis of corrosion, corrosion prevention by cathodic protection, inhibitors, alloying and heat treatment, passivation, stress corrosion cracking, corrosion fatigue

Pre-requisite: CHM 101, CHE 151

1. Materials Science and Engineering: An Introduction, William D. Callister, ISBN-13: 978-0471736967

CHE 461 Quality Control

Credits: 3

Principle, role, management, and history of quality control in chemical industry; concepts, techniques, and procedures of quality control; preparation of statistical control charts and selection of suitable sampling plans; fundamental concepts of reliability and experimental design; Laboratory experiments investigates the principles of quality control.

Pre-requisite: MTH 202

1. Introduction to Statistical Quality Control, Douglas C. Montgomery, ISBN-13: 978-0470169926

CHE 463 Pharmaceutical Technology

Credits: 3

Concepts necessary in the adaptation of engineering principles to pharmaceutical technology; Topics include: process engineering in drug manufacture such as mixing, drying and separation; basic pharmaceutical chemistry, formulations, production and design of drugs

Pre-requisite: CHE 381, CHM 151

1. Pharmaceutical Production: An Engineering Guide, Bill Bennett, Graham Cole, ISBN-13: 978-0852955192

CHE 467 Oil Upstream Operations

Credits: 3

Fundamentals of oil and gas exploration and production; reservoirs; discovery; characterization of, and fluid flow through, porous media; principles of oil production performance, water flooding and enhanced oil recovery techniques

Pre-requisite: CHE 381

1. Oilfield Processing of Petroleum: Oilfield Processing, Vol. 2: Crude Oil by Francis Manning, Richard Thompson, ISBN-13: 978-1596930421

CHE 468 Biotechnology

Credits: 3

Review of basic biological concepts such as cell construction, cell nutrient, and enzyme kinetics; large scale production of enzymes; operation of bioreactors; recovery and purification of products; major biotechnology applications (in medicine, agriculture and environmental science, forensics)

Pre-requisite: CHE 321, CHE 381

1. Bioprocess Engineering: Basic Concepts, 3rd Edition by Michael L. Shuler, Fikret Kargi, Matthew DeLisa
ISBN-13: 978-0137062706

CHE 469 Special Topics in Chemical Engineering Technology

Credits: 3

Topics of interest to chemical engineers not covered in regular courses; specific course description is made available prior to each offering; (May be repeated with change in topic for maximum credit of 3 semester hours)

Pre-requisite: CHE 402

CHE 471 Project in Chemical Engineering Technology

Credits: 3

Faculty supervised term projects or research assigned to individual student or groups on new or developing areas in chemical engineering; a written report and oral presentation are required

Pre-requisite: EN 201, CHE 401

CHE 492 Advanced Process Control

Credits: 3

State space methods; sampled data systems; discrete systems; multi-variable control; ratio and feed-forward control; closed loop analysis; control of complex chemical systems; design of controllers; advanced control techniques

Pre-requisite: CHE 391

1. Process Dynamics and Control, 4e by Dale E. Seborg, Thomas F. Edgar, Duncan A. Mellichamp, Francis J. Doyle
ISBN-13: 978-1119385561

Field Training

CHE 291 Field Training (1)

Credits: 3

Practical training for a period 7 weeks (175 hours) in a chemical industrial facility; Emphasis on the application of chemical principles (mass and energy balance), flow-sheeting, and safety regulations. Practice of engineering ethics, team-work, and self-responsibility

Pre-requisite: CHE 251

CHE 401 Field Training (2)

Credits: 3

Practical training for a period 15 weeks (300 hours) in a chemical industrial facility; Emphasis on reactive processing, control systems, equipment sizing, selection and operation, safety and environment

Pre-requisite: CHE 291, CHE 391

Pre-courses

MTH 095 Pre-Math,

3 hours – 0 credits

Topics in Algebra ranging from linear, quadratic, polynomial, rational, and exponential functions to logarithmic expressions. Vectors and applications of trigonometry. Analytical geometry and calculus concepts such as limits, and derivatives.

CHM 096 Pre-Chemistry

3 hours – 0 credits

Matter and measurement, mass relations in chemistry, stoichiometry, oxidation-reduction reactions, reactions in aqueous solutions, properties of gases, atomic and molecular structure, the periodic table, thermo-chemistry, liquids, solids, and solutions. Organic chemistry, reaction rates, chemical equilibria, acids and bases, pH and precipitation.

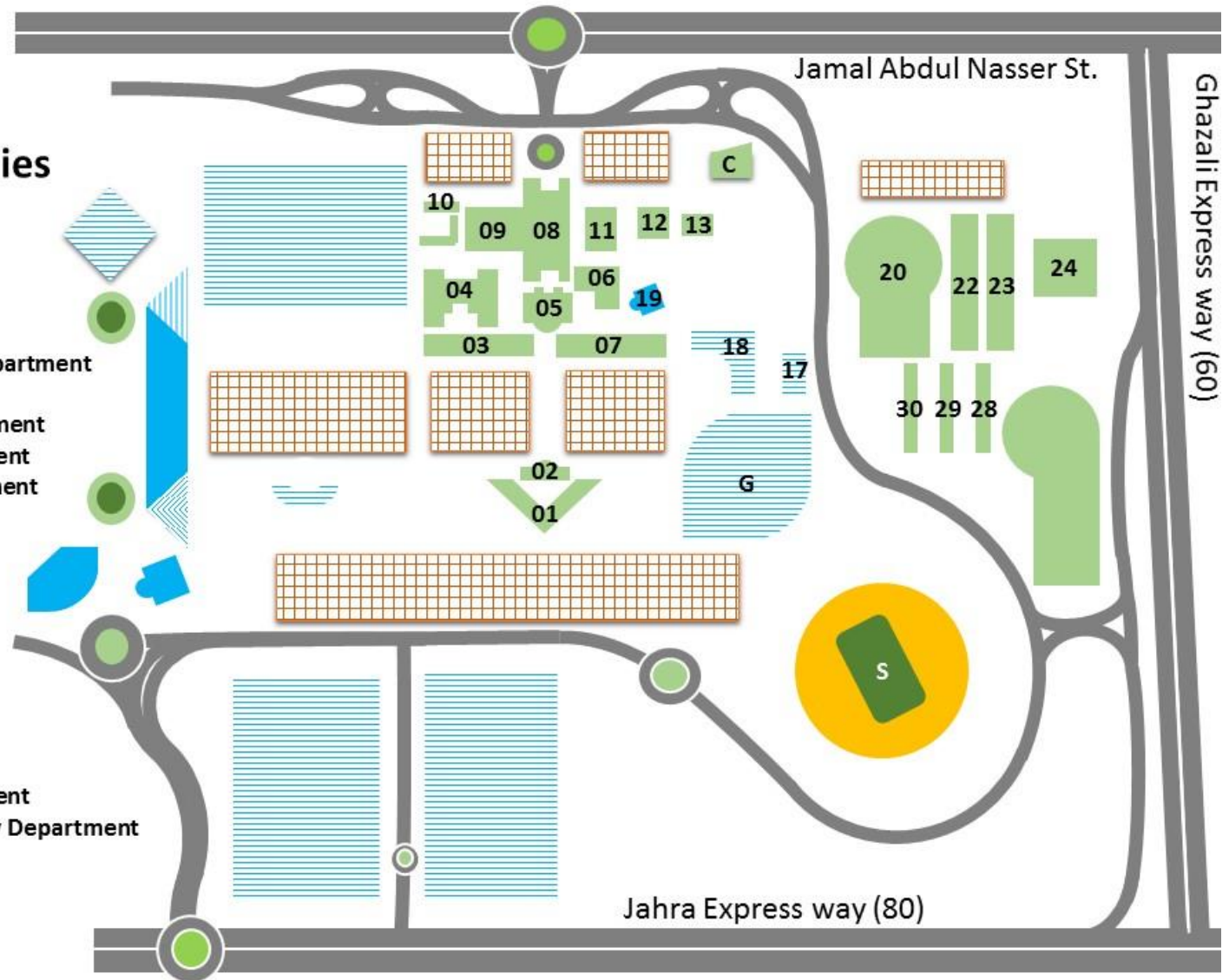
ENG 097 Pre-English
credits

10 hours – 0

Developing the four language skills: listening, speaking, reading, and writing. Focus on improving pronunciation, increasing vocabulary, understanding and practicing English grammar.

College of Technological Studies Campus Map

- 01 College Administration
- 02 Dean & Assistant Deans
- 03 Workshop and Lecture rooms
- 04 Manufacturing Engineering Technology Department
- 05 Computer Laboratories and Lecture rooms
- 06 Petroleum Engineering Technology Department
- 07 Chemical Engineering Technology Department
- 08 Electronic Engineering Technology Department
- 09 Civil Engineering Technology Department
- 10 Civil Engineering Laboratories
- 11 College Library
- 12 Student Cafeteria
- 13 Book Store
- 16 Storages
- 17 Cooling Towers
- 19 Mosque
- 20 Laboratories Technology Department
- 22 Electrical Engineering Technology Department
- 23 Mechanical Power and A/C Eng. Technology Department
- College Buildings
- Other Colleges
- Parking



الهيئة العامة للتعليم التطبيقي و التدريب
عمادة القبول و التسجيل
الخطة الدراسية

الكلية :	كلية الدراسات التكنولوجية	الفصل الدراسي :	الفصل الدراسي الاول 2018-2019
القسم :	تكنولوجيا الهندسة الكيميائية	البرنامج :	تكنولوجيا الصناعات الكيميائية
الدرجة العلمية :	دبلوم	عدد وحدات اللازمة للتخرج :	75 على الأقل
		DP-0444	تكنولوجيا الصناعات الكيميائية

4- مقررات مساندة عامة		(18) وحدة		
مجموعة إجبارية		(18) وحدة		
رمز المقرر	اسم المقرر	الوحده	الساعه	المطلب السابق
102 30 04	انجليزي تقني	3	3	99 30 04 أو
162 30 04	كتابة تقارير فنية	3	3	102 30 04
171 30 04	مهارات التواصل	3	3	102 30 04
99 30 04	لغه انجليزيه علاجى	5	0	
113 56 04	فيزياء عامه	4	3	
105 76 04	رياضيات (1)	3	3	
106 76 04	رياضيات (2)	3	3	105 76 04

الهيئة العامة للتعليم التطبيقي و التدريب

عمادة القبول و التسجيل

الخطة الدراسية

الفصل الدراسي	:	الفصل الدراسي الاول 2018-2019	الكلية	:	كلية الدراسات التكنولوجية
البرنامج	:	DP-0443 تكنولوجيا تشغيل المصافي	القسم	:	تكنولوجيا الهندسة الكيميائية
عدد وحدات اللازمة للتخرج	:	75 على الأقل	الدرجة العلمية	:	دبلوم

رمز المقرر	اسم المقرر	الوحدة	الساعة	المطلب السابق	رمز المقرر	اسم المقرر	الوحدة	الساعة	المطلب السابق
293 81 04	تكنولوجيا المفاعلات	3	3	183 82 04					
295 81 04	قياس وتحكم	3	5	293 81 04					
304 81 04	عمليات تكرير البترول	4	5	293 81 04					
395 81 04	امن وتشغيل معدات المصافي	3	3	273 81 04					
399 81 04	تدريب ميداني	6	18	304 81 04					
169 82 04	مقدمة في الحاسوب	2	4	295 81 04					
183 82 04	حسابات الهندسة الكيميائية	3	3	293 81 04					
282 82 04	تطبيقات الحاسب في الهندسة	2	4	282 82 04					
	مجموعة إختيارية (6) وحدة								
163 81 04	نفظ وغاز طبيعي	3	3	183 82 04					
192 81 04	هندسة البوليمرات	3	3	183 82 04					
286 81 04	تلوث الهواء	3	3	293 81 04					
288 81 04	علم المواد الحفازة	3	3	293 81 04					
305 81 04	مشروع	3	3	304 81 04					
223 82 04	حسابات هندسة كيميائية (2)	3	3	183 82 04					
264 82 04	تاكل صناعي	3	3	293 81 04					
277 82 04	معالجة المياه الصناعية	3	3	273 81 04					
278 82 04	تحلية المياه	3	3	273 81 04					
285 82 04	ديناميكا حرارية للهندسة الكيميائية	3	3	283 81 04					
288 82 04	حلول مثلى	3	3	282 82 04					
289 82 04	موضوعات في الهندسة الكيميائية	3	3	282 82 04					
	مجموعة إختيارية (3) وحدة								
112 03 04	قيم العمل والولاء	3	3						
141 07 04	تربيته فنيه (1)	1	2						
142 07 04	تربيته فنيه(2)	1	2						
110 08 04	تربيته رياضيه	1	2						
104 10 04	بحث ومكتبات	1	2						
151 13 04	تربيته موسيقيه	1	2						
114 15 04	علم نفس صناعي	2	2						
164 21 04	محاسبه	2	2						
104 22 04	تأسيس واداره المشروعات الصغيره	2	2						
166 25 04	اقتصاد صناعي	2	2						
102 57 04	مقدمة في العقود والمواصفات	3	3						
268 64 04	الإبداع والتصميم في التكنولوجيا	2	2						
205 65 04	ميكانيكا السيارات	3	3						
135 66 04	حفظ المياه والطاقة	3	3						
	مقررات تخصصية (48) وحدة								
	مجموعة إجبارية (42) وحدة								
110 75 04	كيمياء عامه	3	4						
255 81 04	ظواهر الانتقال	4	5						
273 81 04	اختبارات بترولية	2	4						
280 81 04	عمليات الوحدات	4	5						
283 81 04	ديناميكا حراريه	3	3						

الهيئة العامة للتعليم التطبيقي و التدريب
عمادة القبول و التسجيل
الخطة الدراسية

الكلية :	كلية الدراسات التكنولوجية	الفصل الدراسي :	الفصل الدراسي الاول 2018-2019
القسم :	تكنولوجيا الهندسة الكيميائية	البرنامج :	تكنولوجيا تشغيل المصافي DP-0443
الدرجة العلمية :	دبلوم	عدد وحدات اللازمة للتخرج :	75 على الأقل

4- مقررات مساندة عامة		(18) وحدة		
مجموعة إجبارية		(18) وحدة		
رمز المقرر	اسم المقرر	الوحدة	الساعة	المطلب السابق
102 30 04	انجليزي تقني	3	3	99 30 04 أو
162 30 04	كتابة تقارير فنية	3	3	102 30 04
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105 76 04	رياضيات (1)	3	3	
106 76 04	رياضيات (2)	3	3	105 76 04