

University of Anbar
جامعة الانبار



First Cycle – Bachelor’s Degree (B.Sc.) - Chemical and Petrochemical Engineering

بكالوريوس – هندسة كيميائية وبتروكيميائية



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1. Overview

This catalogue is about the courses (modules) given by the program of Chemical and Petrochemical Engineering to gain the Bachelor of Science degree. The program delivers (48) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظرة عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج الهندسة الكيميائية والبتروكيميائية للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (٤٨) مادة دراسية، على سبيل المثال، مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

Code	Course/Module Title	ECTS	Semester
UOA 1101	English I	3.00	One
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1/0/0/0	48	٢
Description			
This course is designed to enable academic writing course which provides an opportunity for the students to learn and practice the skills needed for handling topics related to the field of study. The course emphasizes the development of academic writing skills as well as the ability to read and think critically. Students will learn to use the library and appropriate online resources to find and evaluate sources to inform, develop and support their ideas in term paper writing. They will also learn skills for reading analysis, such as comprehension and inference.			

Module 2

Code	Course/Module Title	ECTS	Semester
COE 1102	Computer Science	4.00	one
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	63	3
Description			
<p>This course presents an overview of fundamental computer science topics and an introduction to computer programming. Overview topics include an introduction to computer science and its history, computer hardware, operating systems, digitization of data, computer networks, office and application.</p>			

Module 3

Code	Course/Module Title	ECTS	Semester
COE 1201	Fundamental of Electrical Circuit	6.00	one
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	0/2/0/0	63	6
Description			
<p>Basic Concepts & Basic Laws: System of units, voltage and current, circuit elements, voltage and current sources, electrical resistance and conductance, power and energy, Ohm's and Kirchhoff's laws, Resistances in series and parallel, current and voltage division, delta-star and star-delta transformations. DC circuits' analysis: Nodal analysis, Nodal Analysis with Voltage Sources, Mesh analysis, Mesh Analysis with Current Sources. Circuit Theorems: Linearity Property, Superposition, source transformation, Thevenin's theorems, Norton's theorems and maximum power transfer theorems. Capacitors and Inductors: series and parallel connections of capacitors and inductors.</p>			

Module 4

Code	Course/Module Title	ECTS	Semester
COE 1202	Calculus I	6.00	one
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	0/0/0/0	63	6
Description			
<p>Students are expected to use their mathematical knowledge and practices to solve problems. This course strengthens students' understanding of functions in preparation for the process of</p>			

differentiation and integration. The course provides a comprehensive, thorough, and up to date treatment of engineering mathematics. It is intended to introduce students of engineering, physics, mathematics, computer science, and Related fields to those areas of the applied mathematics that are most relevant for solving practical problems.

Module 5

Code	Course/Module Title	ECTS	Semester
COE 1203	Chemistry	5.00	one
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/2/0/0	78	3
Description			
<p>This course is a comprehensive survey of chemistry for the general student that emphasizes the principles underlying the formation and interaction of chemical substances: stoichiometry, states of matter, thermochemistry, atomic and molecular structure, intermolecular forces, solutions, thermodynamics, kinetics, chemical equilibrium, acids and bases, electrochemistry, and environmental chemistry.</p>			

Module 6

Code	Course/Module Title	ECTS	Semester
CHE 1301	Principles of Chemical Engineering I	6.00	one
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/0/0/1	63	6
Description			
<p>This course will introduce you to a number of principles and concepts that are fundamental to chemical engineering.</p> <p>The fundamentals of engineering calculations (units and dimensions), behavior of fluids, mass balances, processes and process variables. The course gives real-life examples of process industries to provide you with the context engineering in practice. We equip students with creative engineering problem solving techniques and fundamental chemical engineering material balance skills. Lectures, experiments problem, and recitation sessions are designed to provide coordinated training and experience in data analysis, material property estimation for single- and multi-phase systems, basic process flowsheet, reactive and non-reactive mass balances, problem solving strategies and tools, and team dynamics.</p>			

Module 7

Code	Course/Module Title	ECTS	Semester
UOA 1103	Human rights and Democracy	2.00	Two
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/0	33	1
Description			
<p>This course aims to provide students with an understanding of the concept of freedom and the appropriate language and expressions to discuss it in a legitimate and idiomatic manner. It explores the origins of rights from the perspective of Islamic law, delves into the components and various types of rights, including personal and intellectual freedoms, economic rights, and the intersection of Islam and slavery. Additionally, the course examines the objectives of human rights, the responsible use of freedom and rights in a broader context, the rights of Muslims towards their fellow Muslims, parental and neighborly rights, women's rights, and the concept of human rights within heavenly religions.</p>			

Module 8

Code	Course/Module Title	ECTS	Semester
COE 1204	Calculus II	6.00	Two
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/0/0/1	63	6
Description			
<p>This course provides a comprehensive guide and up-to-date treatment of engineering mathematics with an in-depth overview of the many mathematical methods. It is intended to introduce students of engineering, physics, mathematics, computer science, and related fields areas of applied mathematics that are most relevant for solving practical problems.</p>			

Module 9

Code	Course/Module Title	ECTS	Semester
COE 1205	Engineering Drawing	6.00	Two
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	0/3/0/0	63	6
Description			
<p>The fundamentals of engineering drawing including orthographic projection, dimensioning, sectioning, exploded and auxiliary views, assembly drawings, and SolidWorks. Homework drawings are of parts fabricated by the student in the lab.</p>			

Module 10

Code	Course/Module Title	ECTS	Semester
CHE 1302	Physical Chemistry	5.00	Two
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/1/0/0	63	4
Description			
<p>The objective of this course is to develop general methodologies for analysis and design of a variety of systems (chemical, biochemical/biological, polymer, electrochemical) for which engineering of reactions is needed. In the first part of the course, basic concepts of chemical kinetics and chemical reactor design as related to simple reaction systems will be introduced. Topics covered will include the general mole balance, reactor types, conversion and reactor sizing, rate laws and stoichiometry and isothermal reactor design. In the second part of the course, we will build upon the concepts developed in the first half of the course to describe real systems that deal with complex reactions and non-ideal reactors.</p>			

Module 11

Code	Course/Module Title	ECTS	Semester
CHE 1303	Organic Chemistry	5.00	Two
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	63	4
Description			
<p>This course provides a systematic study of the theories, principles, and techniques of organic chemistry. Topics include nomenclature, structure, properties, reactions, and mechanisms of hydrocarbons, alkyl halides, alcohols, and ethers; further topics include isomerization, stereochemistry, and spectroscopy.</p>			

Module 12

Code	Course/Module Title	ECTS	Semester
CHE1304	Principles of Chemical engineering II	6.00	Two
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/0/0/1	63	4
Description			
<p>Energy forms and energy balances and thermodynamic principles. Balances on non-reactive</p>			

processes Balances on reactive processes including fuels and combustion. Solution of simultaneous material and energy balance equations for process flow sheets using suitable software's (computer laboratory).

Module 13

Code	Course/Module Title	ECTS	Semester
COE 2206	Calculus III	6.00	Three
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	0/0/0/0	63	6
Description			
This course provides a comprehensive guide and up-to-date treatment of engineering mathematics with an in-depth overview of the many mathematical methods. It is intended to introduce students of engineering, physics, mathematics, computer science, and related fields areas of applied mathematics that are most relevant for solving practical problems.			

Module 14

Code	Course/Module Title	ECTS	Semester
COE 2207	Physics	5.00	Three
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/0	33	6
Description			
This course uses calculus-based mathematical models to introduce the fundamental concepts that describe the physical world. Topics include units and measurement, vector operations, linear kinematics and dynamics, energy, power, momentum, rotational mechanics, periodic motion, fluid mechanics, and heat. Upon completion, students should be able to demonstrate an understanding of the principles involved and display analytical problem-solving ability for the topics covered. Laboratory experiments, some of which are computer-based, and computerbased tutorials enhance and consolidate the basic principles discussed in the theoretical section of the course.			

Module 15

Code	Course/Module Title	ECTS	Semester
CHE 2306	Physical Chemistry II	4.00	Three
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/1/0/0	48	3
Description			
The goals of this course are to enable students to explore the scope of physical chemistry and its			

importance to chemical engineering education. develop a fundamental understanding of the basic principles of physical chemistry. develop problem-solving ability based on relevant laws, mathematical equations and graphical relationships.

Module 16

Code	Course/Module Title	ECTS	Semester
CHE 2306	Fluid Mechanics I	5.00	Three
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/1/0/0	63	4
Description			
<p>This module reviews the basic principles of fluid mechanics particularly the topics covered in the FE Exam. It first discusses what a fluid is and how it is distinguished from a solid, basic characteristics of liquids and gases, and concepts of normal and shear forces and stresses. The major fluid properties are then discussed. Next fluid statics are addressed: pressure variation in homogeneous and stratified fluids and application to manometers; forces on submerged plane surfaces and buoyancy forces on fully and partially submerged objects. Flowing fluids are then covered. This includes the equations for conservation of mass (the continuity equation) and energy (the Bernoulli equation).</p>			

Module 17

Code	Course/Module Title	ECTS	Semester
CHE 2307	Thermodynamic I	5.00	Three
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	63	4
Description			
<p>This course introduces the basic thermodynamic principles that are widely used in many engineering fields. It will prepare you for degree-level study, by helping you understand and apply thermodynamic fundamentals through real-world, problem-solving exercises.</p>			

Module 18

Code	Course/Module Title	ECTS	Semester
CHE 2308	Mass Transfer I	5.00	Three
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/1	48	5
Description			
<p>This course covers the fundamentals of the basic concepts of mass transport and understanding about</p>			

diffusion theory, gas absorption, liquid-liquid extraction, leaching , distillation, humidification, drying and evaporation.

Module 19

Code	Course/Module Title	ECTS	Semester
UOA 2104	Arabic Language	2.00	Four
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/0	33	1
Description			
This course aims at building students' familiarity with and competence in Arabic literature in its various genres to increase their ability to appreciate literature and to develop their awareness of its concepts through the study of poetry, novel and the short story.			

Module 20

Code	Course/Module Title	ECTS	Semester
COE 2208	Calculus IV	6	Four
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	0/0/0/0	63	6
Description			
This course provides a comprehensive guide and up-to-date treatment of engineering mathematics with an in-depth overview of the many mathematical methods. It is intended to introduce students of engineering, physics, mathematics, computer science, and related fields areas of applied mathematics that are most relevant for solving practical problems.			

Module 21

Code	Course/Module Title	ECTS	Semester
COE 2209	Engineering Mechanics (Static)	6.00	Four
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/0	33	8
Description			
The objective of this course is to introduce students to the basic concepts of engineering mechanics. We will start by reviewing the general method of mechanics and principles of analysis. Then, we will			

define the basic quantities (force and moment) and relations, which are necessary for describing and analyzing, in a systematic mathematical way, the equilibrium of particles and rigid bodies. Along the way, students will also learn how to treat distributed loads and how to find the centroid/center of gravity and moments of inertia of bodies and areas. Eventually, we will put a strong emphasis on applying the concepts to solving the equilibrium of simple structures (trusses, frames and machines) and analyzing internal forces in beams, when they are acted on by external loads.

Module 22

Code	Course/Module Title	ECTS	Semester
UOA 2309	Mass Transfer II	5.00	Four
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/1	48	5
Description			
This course provides students with the fundamentals governing mass transfer and the principles governing a range of processes such as absorption, distillation, humidification, leaching, liquid extraction and adsorption. Students will apply their theoretical knowledge to the design and evaluation of these processes.			

Module 23

Code	Course/Module Title	ECTS	Semester
CHE 2310	Fluid Mechanics II	6.00	Four
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/2/0/0	78	5
Description			
This course deals mainly with the applications of chemical Engineering thermodynamics to phenomena of interest in chemical engineering, such as flow system, expansion and compression processes, with emphasis on phase equilibrium in pure fluid and chemical-reaction equilibrium and thermodynamic analysis of process. A good understanding of the material in this course is essential for the study and understanding of chemical engineering.			

Module 24

Code	Course/Module Title	ECTS	Semester
CHE 2311	Thermodynamic II	5.00	Four
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	63	4
Description			

This course deals mainly with the applications of chemical Engineering thermodynamics to phenomena of interest in chemical engineering, such as flow system, expansion and compression processes, with emphasis on phase equilibrium in pure fluid and chemical-reaction equilibrium and thermodynamic analysis of process. A good understanding of the material in this course is essential for the study and understanding of chemical engineering.

Module 25

Code	Course/Module Title	ECTS	Semester
UOA 3105	Ethics and Leadership Skills	2	Five
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/0	33	1
Description			
This course provides an introduction to ethics in engineering and technology. It helps engineers and students in engineering to acquire the competences mentioned in the ABET criteria or comparable criteria formulated in other countries.			

Module 26

Code	Course/Module Title	ECTS	Semester
COE 3210	Engineering Statistics	4.00	Five
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/0	33	4
Description			
Statistical Engineering models are based on mathematics and probability theory. This course provides students with a working knowledge of fundamental statistics principles and probability in addition to a preface to the regression and correlation analysis. By the end of the semester, students should be able to determine when each of the various topics we have covered is appropriate to use, and to apply them to practical engineering situations or problems. This course will cover techniques on data collection (presentation, descriptive statistics, basic elements of probability theory, sampling techniques theory, statistical estimation, hypothesis testing and regression analysis.			

Module 27

Code	Course/Module Title	ECTS	Semester
CHE 3210	Reactor Design I	6	Five
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/0/0/1	63	6

Description
<p>This course provides a detailed and in-depth analysis to the principles of chemical kinetics, and reactor analysis and design. The topics in chemical kinetics include: rate constants, reaction order, rate equations for elementary and complex reactions, kinetic data analysis, and product distribution. In reactor analysis and design, discussion is focused on ideal reactor systems and arrangements, including batch reactors, plug flow reactors, continuous stirred tank reactors, and recycle reactors. The last part of the course considers homogeneous and heterogeneous catalytic reactions. The design component consists of how to make an appropriate choice of reactor type and operating conditions to optimize a desired product; sizing such reactors and determining conversion levels under various conditions of temperature and pressure; determination of reaction kinetics from experimental data.</p>

Module 28

Code	Course/Module Title	ECTS	Semester
CHE 3313	Unit Operation I	6	Five
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/0/0/1	63	6
Description			
<p>This course deals mainly with the study and concept of the operations involving particulate solids: properties, modification, separation, settling and flow through porous media.</p>			

Module 29

Code	Course/Module Title	ECTS	Semester
CHE 3314	Heat Transfer I	6	Five
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/1/0/0	63	6
Description			
<p>This course deals mainly with an introduction of thermal energy transfer problems which occur in the process industry (Chemical, Petrochemical, food, Pharmaceuticals, etc.) It also gives an Introduction to the 3 modes of heat transfer: Conduction, convection and radiation, heat transfer. Finally, the course reviews heat transfer with phase change and describe heat exchangers and their design.</p>			

Module 30

Code	Course/Module Title	ECTS	Semester
CHE 3315	Engineering Material	6.00	Five
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	63	6
Description			

This course is created specifically for the concept behind strength of material. Topics covered are :- Stress strain relationship, true stress & strain, elastic constants, Bending & shearing stress, Beams & many more along with a bonus lecture containing important formulas & tips.

Module 31

Code	Course/Module Title	ECTS	Semester
COE 3211	Numerical Methods	5.0	Six
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/1/0/1	63	4
Description			
<p>In numerical analysis one explores how mathematical problems can be analyzed and solved with a computer. As such, numerical analysis has solved with a computer. As such, numerical analysis has very broad applications in mathematics, physics, engineering, finance, and the life sciences. This course gives an introduction to this subject for mathematics majors, Theory and practical examples using MATLAB will be combined to study a range of topics ranging from simple root-finding procedures to differential equations and the finite element method.</p>			

Module 32

Code	Course/Module Title	ECTS	Semester
CHE 3216	Unit Operation II	5.00	Six
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/0/0/1	63	4
Description			
<p>This course is a complementary to the third-year course Unit Operation I at which the student gained an introductory to unit operations through studying diffusion, absorption, and distillation in the first place. The covered topics in this course are meant to deal with: Boundary layer theory and its applications in chemical processes, the analogies between momentum, heat, and mass transfer such as Reynolds analogy, the Evaporation which is a type of the separation process, drying (mainly used in food industry), humidification and dehumidification to design cooling towers, extraction, leaching, crystallization, and adsorption.</p>			

Module 33

Code	Course/Module Title	ECTS	Semester
CHE 3317	Reactor Design II	6	Six

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/0/0/1	63	6
Description			
<p>This course aims to establish fundamental knowledge of reaction engineering and kinetics for students in chemical engineering and pharmaceutical engineering. Chemical reactions occur in different phases including the gas phase, in solutions with different solvents, between interfaces including gas-solid and liquid-solid, and other interfaces in solid and liquid states. Presentation of the course starts by introducing the chemical reaction engineering algorithm and then utilises it to solve problems in both steady and unsteady state isothermal and nonisothermal reactors. Collection and analysis of reaction rate data, complex mechanisms and bioreactors are also discussed. At the end of the course catalysis is introduced as well as the effects of combined diffusion and reactions on catalyst particles.</p>			

Module 34

Code	Course/Module Title	ECTS	Semester
CHE 3318	Engineering Environment	4	Six
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/0/0/0	48	3
Description			
<p>This course prepares candidates to deal with the challenges of pollution and other environmental damages. The professionals are responsible for making in-depth study of situations and suggesting measures to mitigate the damage or control the occurrence of future events which pose severe threat to the environment. This course is very popular and relevant in modern times, with every human activity posing threat to environment destruction and contamination. Therefore, many top colleges have opened Department of Environmental Engineering in order to produce effective environment engineers who protect the environment.</p>			

Module 35

Code	Course/Module Title	ECTS	Semester
CHE 3319	Heat Transfer II	6	Six
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/1/0/0	63	6
Description			
<p>This undergraduate course provides an introductory treatment of steady and transient conduction, natural and forced convection and radiation heat transfer with applications to basic heat exchanger design and other multimode problems. Students will work through textbook problem and lecture material to establish the relationship between these principals and practical applications.</p>			

Module 36

Code	Course/Module Title	ECTS	Semester
CHE 3320	Chemical & Petrochemical Industry	4	Six
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	0/0/0/0	63	2
Description			
<p>This course discusses the structure of the industry, the historical development of keystone technologies, and the common flowsheet elements that have proven to be commercially successful. It draws examples from a range of industry sectors, production scales, chemistries, and enabling technologies. It examines the industry in light of the factors that have most influenced its development, including raw materials of choice, energy availability, and the development of new unit operations, as well as those that will influence its future course, such as advances in science and technology, environmental impact minimization, water availability, and sustainability concerns.</p>			

Module 37

Code	Course/Module Title	ECTS	Semester
COE 4212	Engineering Economy	3.00	Seven
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/0	33	3
Description			
<p>Statistical Engineering models are based on mathematics and probability theory. This course provides students with a working knowledge of fundamental statistics principles and probability in addition to a preface to the regression and correlation analysis. By the end of the semester, students should be able to determine when each of the various topics we have covered is appropriate to use, and to apply them to practical engineering situations or problems. This course will cover techniques on data collection (presentation, descriptive statistics, basic elements of probability theory, sampling techniques theory, statistical estimation, hypothesis testing and regression analysis.</p>			

Module 38

Code	Course/Module Title	ECTS	Semester
CHE 4321	Petroleum & Natural gas Engineering	5	Seven
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/1/0/0	63	4
Description			
<p>This course deals mainly with the study of concept of gas processing, the principal types of natural gas, its applications both as feedstock in petrochemicals industries and as an energy source. The course also discusses the main low temperatures process such as liquefaction cycles, and separations process related to natural gas. It also introduces recent advanced technology related to LNG, storage and transport equipment</p>			

Module 39

Code	Course/Module Title	ECTS	Semester
CHE 4322	Transport Phenomena	6.00	Seven
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/0/0/1	63	6
Description			
<p>The course advances the fundamentals of material, momentum and energy transfer. Emphasis is placed on the theory and analysis of diffusion, convection and interphase transport of material in laminar and turbulent streams and their similarities. Applications in engineering and environmental transport processes are presented, and the modelling of complex processes is considered.</p>			

Module 40

Code	Course/Module Title	ECTS	Semester
CHE 4323	Equipment Design	5.00	Seven
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/0/0/0	48	5
Description			
<p>In this course, the student will look deeply into the main parts of the chemical equipment, and how these parts will work together for desired product. The course covers the steps to design a heat exchanger; a distillation column, and a vessel (time permit). The course will cover the optimization for each equipment.</p>			

Module 41

Code	Course/Module Title	ECTS	Semester
CHE 4324	Control Porcesses I	5.00	Seven
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/0	33	6
Description			
<p>Process control is the ability to monitor and adjust a process to give a desired output. It is used in industry to maintain quality and improve performance. An example of a simple process that is controlled is keeping the temperature of a room at a certain temperature using a heater and a thermostat. Other examples, material and energy balances are used to model unsteady state (dynamic) process systems where control algorithms are required to bring the process back to equilibrium. Therefore, this course applies the key concepts of automatic control and instrumentation to process plants.</p>			

Module 42

Code	Course/Module Title	ECTS	Semester
CHE 4325	Project I	6.00	Seven
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
0	0/0/4/0	63	6
Description			
<p>A two-part project (CHE 496 and CHE 497). The student uses the previous knowledge gained through out of his course study of the various chemical engineering courses to design or model or perform experiments to meet graduation requirement</p>			

Module 43

Code	Course/Module Title	ECTS	Semester
CHE 4326	Control Porcesses II	5.00	Eight
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/0	33	6
Description			
<p>The goals of this course are to enable students to apply the fundamental mechanic equations to derive and analyze the transfer function for advanced electromechanical systems. Design PID controllers for any control system in order to obtain optimum signal output. Know the stability case, instability case and the percentage of error for any control system. Construct a signal flow system from block diagrams. Construct state space matrix for dynamic, electrical, thermal systems</p>			

Module 44

Code	Course/Module Title	ECTS	Semester
CHE 4327	Petroleum Refinery	5.00	Eight
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	0/0/0/0	63	4
Description			
<p>Characterization and evaluation of crude petroleum. Application of chemical engineering to the oil industry. Refining techniques, physical separation, chemical conversion and treating processes. Design and costing of refinery equipment. Product testing and specifications. Environmental issues</p>			

Module 45

Code	Course/Module Title	ECTS	Semester
CHE 4328	Technology of Catalyst	4	Eight
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/0	33	4
Description			
<p>The global objective of the course is to provide the student with an advanced training in Catalysis including the principles, mechanisms and applications of the different types of catalysts that operate both in homogeneous phase, such as organometallic catalysts and organocatalysts, and in heterogeneous phase.</p>			

Module 46

Code	Course/Module Title	ECTS	Semester
CHE 4329	Engineering Analysis and modeling	5.00	Eight
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/1/0/0	63	4
Description			
<p>Study of scientific strategies for the design of chemical processes. Process Design involves the use of the principles of chemistry, physics, biology and computer software to create industrial chemical processes that satisfy social needs while returning a profit.</p>			

Module 47

Code	Course/Module Title	ECTS	Semester
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CHE 4330	Corrosion Engineering	5	Eight
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/0/0/0	48	5
Description			
Corrosion Engineering provides you with a thorough training in corrosion and its control. Initially, you will study the fundamental chemistry, physics, and metallurgy underpinning corrosion processes. Subsequently, you will learn about approaches to corrosion control, ranging from material selection, through cathodic protection, to corrosion inhibition and protective coatings			

Module 48

Code	Course/Module Title	ECTS	Semester
CHE 4331	Project II	6.0	Eight
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
0	0/0/4/0	63	6
Description			
A two-part project (CHE 496 and CHE 497). The student uses the previous knowledge gained through out of his course study of the various chemical engineering courses to design or model or perform experiments to meet graduation requirement			

Contact

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