University of Misan
جامعة ميسان

First Cycle – Bachelor's Degree (B.Sc.) - Chemical Engineering

بكالوريوس - هندسة كيمياوية

Table of Contents | جدول المحتويات

1. Mission & Vision Statement

Vision Statement

Our vision as academic staff in the Chemical Engineering academic staff at the University of Baghdad is to lead the way in advancing scientific knowledge, technological innovation, and sustainable solutions for a better future. We are committed to fostering a collaborative and inclusive environment that cultivates excellence in education, research, and service. In our pursuit of excellence, we aim to equip our students with a comprehensive understanding of the principles and practices of chemical engineering, preparing them to be innovative problem solvers and ethical leaders in the global community. We strive to provide them with hands-on experiences, cutting-edge research opportunities, and a strong foundation in core technical skills, enabling them to contribute effectively to the industry and society. As academic staff, we are dedicated to pushing the boundaries of knowledge through impactful research. We seek to address pressing challenges in areas such as sustainable energy, environmental protection, pharmaceuticals, advanced materials, and process optimization. By collaborating with industry partners, governmental agencies, and other

academic institutions, we aim to translate our research findings into practical applications that positively impact society. Beyond the classroom and laboratory, our vision is comprehensive. We are dedicated to cooperating with the neighborhood and proactively advancing the wise and sustainable use of resources. We work to increase awareness of the contribution of chemical engineering to tackling global concerns and motivating future generations of engineers through outreach activities, public lectures, and partnerships with regional organizations.

Mission Statement

The mission of the academic staff in Chemical Engineering is to provide great education, pursue cutting-edge research, encourage entrepreneurship, give back to the community, and support professional growth. We want to have a beneficial influence on the area of chemical engineering and society at large via our passion and dedication. As members of the academic faculty, we are dedicated to providing high-quality instruction that gives our students the ethical perspective, technical proficiency, and knowledge needed to succeed in the area of chemical engineering. We try to develop critical thinking, problem-solving skills, and a solid foundation in fundamental concepts via challenging coursework, realistic laboratory experiences, and practical training. We provide a welcoming learning atmosphere that values diversity, cooperation, and lifelong learning. Academic staff members are also devoted to the ongoing professional growth, to keep up with the most recent developments in the industry. As academic staff, we strongly advise membership in conferences, seminars, and professional groups. We promote a culture of excellence and lifelong learning by offering mentoring and assistance for professional advancement.

2. Program Specification

Programme code:	BSc-Chemical Engineering	**ECTS**	240
Duration:	4 levels, 8 Semesters	**Method of Attendance:**	Full Time

A Bachelor of Science in Chemical Engineering is an undergraduate program that offers students with a thorough foundation in the concepts and applications of chemical engineering. This degree normally takes four years to finish and prepares students for entry-level work in many sectors or additional study at the graduate level. The first year of a Bachelor's degree in Chemical Engineering is often spent laying the groundwork in mathematics, physics, chemistry, and beginning engineering courses. In the second year of a chemical engineering bachelor's program, students often delve further into fundamental concepts and start to apply their knowledge to more complex ideas. Students often dig further into advanced chemical engineering principles and obtain more specialized knowledge in particular areas of the profession in the third year of a Bachelor's degree in Chemical Engineering. The fourth and final year of a Chemical Engineering bachelor's degree program is when students often take part in more challenging curriculum, advanced laboratory work, and frequently a significant design project.

3. Program Goals

1. to provide students a solid foundation in fundamental chemical engineering ideas and principles. Deep knowledge of chemistry, process design, thermodynamics, reaction engineering, and unit operations are all part of this.

2. To give students the opportunity to strengthen their leadership and management abilities through the curriculum. In order to prepare students for prospective leadership responsibilities in their future employment, they study team leadership, resource allocation, and project management.
3. To equip students for successful jobs in a variety of fields such as chemical production, energy, pharmaceuticals, environmental engineering, and others. Furthermore, it provides a good basis for students interested in continuing higher studies in chemical engineering or related areas at the graduate level.
4. To promote a lifelong learning and professional growth mentality. Students are urged to keep current with field innovations, explore continuing education programs, and participate in professional groups and events to further their knowledge and abilities throughout their careers.
5. To improve one's capacity for cooperation and communication. Both verbally and in writing, students learn how to present their thoughts and conclusions in a clear and professional manner. Through group tasks and activities, they also hone their cooperation and collaboration abilities.

4. Student Learning Outcomes

The student learning outcomes are a reflection of the knowledge, abilities, and attitudes that graduates of Chemical Engineering programs are expected to possess. They enable students to make significant contributions to society and prepare them for professions in industry, research, academia, and entrepreneurship.

Outcome 1

An ability to distinguish identifies, define, formulate, and solve engineering problems by applying principles of engineering, science and mathematics.

Outcome 2

An ability to produce engineering designs that meet desired needs within certain constraints by applying both analysis and synthesis in the design process.

Outcome 3

An ability to create and carry out proper measurement and tests with quality assurance, analyze and interpret results, and utilize engineering judgment to make inferences.

Outcome 4

An ability to skillfully communicate orally with a gathering of people and in writing with various managerial levels.

Outcome 5

An ability to perceive ethical and professional responsibilities in engineering cases and make brilliant judgments taking into account the consequences in worldwide financial, ecological and societal considerations.

Outcome 6

An ability to perceive the continual necessity for professional knowledge growth and how to find, assess, assemble and apply it properly.

Outcome 7

An ability to work adequately on teams and to set up objectives, plan activities, meet due dates, and manage risk and uncertainty.

5. Academic Staff

Mudhaffar Yacoub Hussein	**PhD in Chemical Engineering**	**Assist. Professor**	**myhussein2017@uomisan.edu.iq**
Mohammed Razzaq	**PhD in Material Engineering**	**Assist. Professor**	**mohammedrazzaq14@uomisan.edu.iq**
Hanoon Hasan	**PhD in Physical Chemistry**	**Assist. Professor**	**hanoon@uomisan.edu.iq**
Nsaif Jasim Hadi	**MSc in Communications and Computer Engineering**	**Assist. Professor**	**nsf_jsm@uomisan.edu.iq**
Ali Hussein	**PhD in Mechanical Engineering**	**Lecturer**	**al_azzawwi@uomisan.edu.iq**
Abouther Thalib	**PhD in Chemical Engineering**	**Lecturer**	**abouther@uomisan.edu.iq**
Noor kadhim	**PhD in Material Engineering**	**Lecturer**	**noor.kf@uomisan.edu.iq**
Salam Abdul-Zahra	**MSc in Chemical Engineering**	**Assist. Lecturer**	**mailto:Salam.iq2022@uomisan.edu.iq**
Huda Radi	**MSc in Chemical Engineering**	**Assist. Lecturer**	**huda.alkanani@uomisan.edu.iq**
Hanan Hashim abed	**MSc in Chemical Engineering**	**Assist. Lecturer**	**hananalmaula@uomisan.edu.iq**
Murtadha Mohmmed	**MSc in Chemical Engineering**	**Assist. Lecturer**	**chemical.nano22@gmail.com**
maryam jebur jaafer	**MSc in Chemical Engineering**	**Assist. Lecturer**	**maryam.j.j@uomisan.edu.iq**

6. Credits, Grading and GPA

Credits

University of Baghdad is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Calculation of the Cumulative Grade Point Average (CGPA)

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

   CGPA of a 4-year B.Sc. degree:

   CGPA = [(1st ^{m}odule score x ECTS) + (2nd ^{m}odule score x ECTS) + ……] / 240

7. Modules Catalogue

Overview

This catalogue is about the courses (modules) given by the program of Chemical 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.

Undergraduate Courses 2023-2024

Module 1

Code	**Course/Module Title**	**ECTS**	**Semester**
CHEN126	Organic Chemistry	8	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	3/3/1/0	108	92
Description			
The aim of an Organic Chemistry course is to learn about the structure, characteristics, composition, reactions, and synthesis of organic molecules, which are predominantly made up of carbon atoms. Organic chemistry is the discipline of chemistry that studies carbon-based molecules such as hydrocarbons and their derivatives. The course typically covers a wide range of topics, such as organic compound nomenclature (naming), the study of functional groups and their reactions, stereochemistry, organic reaction mechanisms, and the analysis and characterization of organic compounds using various spectroscopic techniques. Also, An Organic Chemistry course's overall goal is to educate students with a thorough grasp of organic molecules, their characteristics, reactions, and applications. It provides students with the information and abilities they need to pursue future studies or jobs in chemistry and related fields. An Organic Chemistry course's overall goal is to educate students with a thorough grasp of organic molecules, their characteristics, reactions, and applications. It provides students with the information and abilities they need to pursue future studies or jobs in chemistry and related fields.			

Module 2

Code	**Course/Module Title**	**ECTS**	**Semester**
ENG115	Mathematics I	6	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/0/2	63	87
Description			
The aim of the mathematics course is to help students improve their logical thinking, reasoning, and mathematical understanding. In many fields, including science, engineering, economics, and computer science, mathematics is a key tool. Overall, the goal of studying mathematics is to provide students a			

strong foundation in the subject's knowledge and abilities, empowering them to think critically, work through issues, and apply mathematical concepts to a variety of situations. Quantitative thinking and analysis are made easier in a variety of disciplines thanks to mathematics, which acts as a universal language that supports scientific research and technological development.

Module 3

Code	**Course/Module Title**	**ECTS**	**Semester**
ENG128	Engineering Drawing	5	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	0/2/0/1	63	62
Description			
The aim of studying the fundamentals of engineering drawing is to acquire the abilities and information required to produce precise and understandable technical drawings. To communicate and record their ideas, plans, and requirements, engineers, manufacturers, and other professionals use these drawings as a common language. Overall, the purpose of learning the fundamentals of engineering drawing is to give students the ability to produce standard, accurate, and clear technical drawings that effectively communicate design intent, streamline manufacturing procedures, and encourage collaboration between various stakeholders involved in the development of engineering systems and products.			

Module 4

Code	**Course/Module Title**	**ECTS**	**Semester**
ENG115	Physics Fundamentals	3	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/0/0	33	42
Description			

The fundamental ideas and concepts of physics will be explained to students as part of the Fundamentals of Physics course. Conceptual Understanding, Mathematical Skills, Scientific Inquiry, Problem-Solving Skills, Critical Thinking, Laboratory Skills, Application of Physics, Quantitative Reasoning, Collaboration and Communication, and Appreciation of the Natural World are some examples of the particular aims that might be set. The overall aim of the Fundamentals of Physics course is to give students a solid foundation in physics so they can comprehend and apply fundamental concepts, develop scientific thinking abilities, and get ready for further studies or careers in physics or other scientific fields.

Module 5

Code	**Course/Module Title**	**ECTS**	**Semester**
UOM112	English Language I	2	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/2/0	63	37
Description			
The English language I course is designed to help students improve their reading, writing, listening, and speaking abilities in English. Students who learn English are able to converse easily and successfully with English speakers from all around the world. Furthermore, studying English allows students to get access to worldwide sources of knowledge and information that are only available in English. Many essential studies, research, and educational materials are available in English, and a thorough comprehension of these resources gives pupils a better chance of academic and professional success. Language proficiency, reading comprehension, writing skills, cultural awareness, critical thinking, digital literacy, language analysis, preparation for further studies or careers, and lifelong learning are examples of specialized aims.			

Module 6

Code	**Course/Module Title**	**ECTS**	**Semester**
CHEN111	Engineering Mechanics and Strength of Material	5	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/2/0/1	93	32
Description			

Engineering Mechanics is a fundamental course in engineering that deals with the behavior of bodies under the action of forces or displacements. It typically covers:

Statics: Study of bodies at rest under various force systems, equilibrium of particles and rigid bodies, analysis of trusses, frames, and machines.

Dynamics: Study of bodies in motion under the action of forces.

Kinematics: Motion without regard to forces.

Kinetics: Motion considering forces causing motion.

Mechanics of Materials: Study of the behavior of solid bodies subjected to various types of loading.

Stress and strain analysis, Axial loading, torsion, bending, and combined loading, Material properties and their effect on deformation and failure.

Strength of Materials builds upon concepts from Engineering Mechanics, focusing more on the internal forces and stresses within a material due to external forces. Topics include:

Stress and Strain: Types of stresses (tensile, compressive, shear) and strains (normal, shear).

Mechanical Properties: Yield strength, ultimate strength, modulus of elasticity, ductility, toughness, and hardness.

Analysis of Beams and Shafts: Determination of bending moments, shear forces, and deflections in beams and shafts.

Columns and Buckling: Analysis of compression members and criteria for stability.

Torsion: Stress and deformation analysis in circular shafts subjected to twisting.

Thin-walled Pressure Vessels: Stresses due to internal pressure in cylindrical and spherical vessels.

This course is essential for understanding how structures and mechanical components behave under different loading conditions, ensuring designs are safe and efficient.

Module 7

Code	**Course/Module Title**	**ECTS**	**Semester**
CHEN116	Analytical Chemistry	8	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/3/1/0	108	67
Description			
Analytical Chemistry is a course that studies the theory, methodology, and applications of chemical analysis. Analytical chemistry is a discipline of chemistry concerned with the qualitative and quantitative assessment of a substance's chemical composition and characteristics. Furthermore, the aim of Analytical Chemistry is to give students with the information and abilities required to execute accurate and exact chemical analysis. Students get an awareness of many analytical approaches, their			

concepts, and applications by studying this course. They learn how to plan and carry out analytical experiments, as well as how to evaluate analytical data and solve analytical issues. Pharmaceuticals, environmental monitoring, forensic science, food safety, and research and development all rely on analytical chemistry.

Module 8

Code	**Course/Module Title**	**ECTS**	**Semester**
CHEN125	Principles of Chemical Engineering	9	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/0/1/1	78	97
Description			
The Principles of Chemical Engineering subject's aim is to introduce students to the fundamental concepts and principles that underpin chemical engineering. Chemical engineering is a subject that uses chemistry, physics, mathematics, and engineering concepts to design, develop, and optimize processes for the manufacture, transformation, and management of chemicals and materials. The Principles of Chemical Engineering curriculum also aims to give students with a firm foundation in the fundamental principles and ideas required for chemical engineering practice. Students learn the abilities needed to assess, design, and optimize chemical processes, as well as diagnose and solve engineering problems, by comprehending these concepts. Students will be well-prepared for additional study and specialization in numerous fields of chemical engineering, as well as professions in sectors such as petroleum, pharmaceuticals, food processing, energy, and environmental engineering.			

Module 9

Code	**Course/Module Title**	**ECTS**	**Semester**
ENG124	Mathematics II	5	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/0/2	63	62
Description			
The aim of the mathematics course is to help students improve their logical thinking, reasoning, and mathematical understanding. In many fields, including science, engineering, economics, and computer			

science, mathematics is a key tool. Overall, the goal of studying mathematics is to provide students a strong foundation in the subject's knowledge and abilities, empowering them to think critically, work through issues, and apply mathematical concepts to a variety of situations. Quantitative thinking and analysis are made easier in a variety of disciplines thanks to mathematics, which acts as a universal language that supports scientific research and technological development.

Module 10

Code	**Course/Module Title**	**ECTS**	**Semester**
ENG123	Workshop Technology	2	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
0	0/2/0/0	33	17
Description			
Workshop Technology course are designed to give students practical information and skills about the numerous tools, equipment, and procedures needed in a workshop or industrial environment. Workshop Technology seeks to improve students' knowledge of fundamental production procedures, safety precautions, and practical skills necessary in a workshop setting. The overall goal of studying workshop technology is to provide students with the practical abilities, information, and safety awareness needed to function successfully and efficiently in a workshop or industrial setting. It offers a basis for comprehending production procedures, working with tools and equipment, carrying out workshop duties, and upholding quality standards. Students who study workshop technology are better prepared for professions in fabrication, engineering, manufacturing, and other related disciplines where practical knowledge is crucial.			

Module 11

Code	**Course/Module Title**	**ECTS**	**Semester**
ENG127	Computer I	4	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	0/2/0/0	48	52
Description			
The objective of the computer course is to provide students a thorough grasp of computers, how they work, and what applications they may be used for. The overall goal of the Computer subject is to give students a strong foundation in computer science principles, programming abilities, and problem-			

solving strategies. It prepares them for future education or professions in a variety of sectors, including software development, data science, computer engineering, artificial intelligence, cybersecurity, and more. To help students adapt to the quickly changing technology world, computer courses also attempt to promote computational thinking and digital literacy.

Module 12

Code	**Course/Module Title**	**ECTS**	**Semester**
UOM121	Democracy and Human Rights	2	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/0/0	33	17
Description			
The Democracy and Human Rights course seeks to provide students a thorough grasp of democratic norms, human rights concepts, and their interrelationship. Its main objective is to advance critical thinking, knowledge, and understanding of democracy and human rights concerns. The Human Rights and Democracy course's overarching goal is to provide a thorough grasp of democratic norms and the role that human rights principles play in society. It gives students the know-how, abilities, and attitudes needed to promote human rights, participate in democratic processes, and achieve a more equitable and inclusive society.			

Module 13

Code	**Course/Module Title**	**ECTS**	**Semester**
CHEN216	Physical Chemistry	7	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/3/1/1	109	66
Description			
The aim of studying physical chemistry is to provide students a thorough grasp of the underlying concepts and theories that underpin chemical systems, as well as how these systems behave at the atomic and molecular levels. To describe and examine the physical characteristics, compositions, and transformations of matter, physical chemistry blends ideas from physics and chemistry. Also, the aim of studying physical chemistry is to increase students' comprehension of the underlying concepts that underpin chemical systems and behavior. It offers a theoretical framework for examining and forecasting the characteristics, compositions, and modifications of matter at the molecular level.			

Numerous applications in the domains of materials science, chemical engineering, pharmaceuticals, environmental research, and many other disciplines depend on physical chemistry.

Module 14

Code	**Course/Module Title**	**ECTS**	**Semester**
CHEN215	Material Balance	6	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/0/0/1	63	87
Description			
The purpose of studying material balance is to improve students' comprehension of the concepts and methods used to identify and resolve issues related to material flow and conservation in chemical processes. Chemical engineers must quantify the inputs, outputs, and transformations of materials inside a system in order to understand the fundamental idea of material balance. The overall goal of studying Material Balance in the department of chemical engineering is to improve students' ability to identify and resolve issues with material flow in chemical processes. It offers a basis for comprehending and improving process operations, guaranteeing resource efficiency, and taking environmental concerns into account. Chemical engineers must have a strong understanding of material balance in order to design, run, and manage processes in a way that is secure, economical, and long-lasting.			

Module 15

Code	**Course/Module Title**	**ECTS**	**Semester**
CHEN214	Materials Properties	5	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/0/0/1	63	62
Description			
Students will get a thorough grasp of the characteristics and behavior of materials utilized in engineering applications through studying material properties. Studying a material's mechanical, thermal, electrical, and chemical characteristics is known as material properties. The study of material properties generally aims to increase students' knowledge of the characteristics and behavior of materials used in engineering applications. It offers the framework for material choice, design, and			

analysis across a range of engineering specialties. For engineers working in disciplines like mechanical engineering, civil engineering, materials science, and manufacturing, an understanding of material characteristics is essential since it affects the performance, dependability, and safety of designed systems and structures.

Module 16

Code	**Course/Module Title**	**ECTS**	**Semester**
ENG213	Mathematics III	4	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/0/2	63	59
Description			
Mathematical studies often include increasingly complex and advanced mathematical theories and procedures while building upon the fundamental concepts and abilities obtained in prior mathematics courses. To provide pupils a greater knowledge of mathematics, its theories, and its applications is the aim of mathematics. It seeks to enhance their capacity for analytical thought, problem-solving, and mathematical reasoning so they may master challenging mathematical concepts and flourish in careers that need sophisticated mathematical understanding.			

Module 17

Code	**Course/Module Title**	**ECTS**	**Semester**
CHEN212	Engineering Management	2	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/0/0	33	17
Description			
The aim of the Engineering Management course is to equip students with a thorough grasp of the ideas, concepts, and abilities required to manage engineering projects, teams, and organizations efficiently. It bridges the gap between technical skill and managerial ability by combining engineering knowledge with management concepts. Overall, the goal of the Engineering Management topic is to train engineers for managerial roles and to provide them with the knowledge and abilities needed to handle the complex problems of managing engineering projects and organizations. It integrates technical knowledge with commercial acumen, leadership abilities, and ethical concerns to produce well-rounded engineering professionals capable of driving success in both technical and management			

areas.

Module 18

Code	Course/Module Title	ECTS	Semester
UOB211	Computer programming I	3	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
0	0/2/0/0	33	42
Description			
Giving students a solid knowledge of the fundamental concepts, ideas, and practices relating to computers is the goal of studying computer science. A solid foundation in computing concepts, problem-solving techniques, and technical expertise are the main goals of studying computer science, in general. It trains students for a range of employment in disciplines like research, computer networking, data analysis, software development, and artificial intelligence. In the digital era, computer science is crucial because it provides people with the knowledge and abilities they need to function in and contribute to the quickly changing technological environment.			

Module 19

Code	Course/Module Title	ECTS	Semester
UOM120	**Ba'ath Party Crimes**	2	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/0/0	33	17
Description			

The Ba'ath Party, particularly under the leadership of Saddam Hussein in Iraq, committed numerous human rights violations and crimes against humanity during its rule. These crimes include:

- **Genocide**: Targeted killings and campaigns against ethnic and religious minorities, such as the Kurdish population in Iraq.
- **Chemical Attacks**: Use of chemical weapons against civilian populations, most notably in the Halabja massacre in 1988.
- **Political Oppression**: Systematic repression of political dissent through torture, arbitrary arrests, and executions.

- **Forced Displacement**: Large-scale forced displacement of populations to suppress dissent and consolidate control.
- **Massacres**: Instances of mass killings of civilians perceived as threats to the regime.

These actions were condemned internationally for their severity and scale, contributing to the Ba'ath Party's legacy of authoritarianism and human rights abuses in the region.

Module 20

Code	**Course/Module Title**	**ECTS**	**Semester**
CHEN226	Fluid Flow	8	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/3/0/1	109	91
Description			
The aim of studying fluid flow is to increase students' comprehension of the dynamics and guiding principles that shape fluid behavior, particularly in the context of engineering applications. The study of fluid flow is investigating how gases and liquids move in response to various forces and circumstances. The overall goal of studying fluid flow is to increase students' understanding of fluid behavior, properties, and use in engineering systems. The analysis and design of fluid flow systems, including pipe networks, and hydraulic systems, are made possible by this foundation. For engineers in disciplines including mechanical engineering, chemical engineering, civil engineering, and aerospace engineering, a knowledge of fluid dynamics is necessary for creating Engineers working in disciplines including chemical engineering, mechanical engineering, civil engineering, and aerospace engineering need to understand fluid flow since these disciplines depend on fluid behavior to build effective and dependable systems.			

Module 21

Code	**Course/Module Title**	**ECTS**	**Semester**
CHEN225	Energy Balance	5	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/0/0/1	63	62

Description
The aim of studying Energy Balance is to improve students' comprehension of energy conservation and its use in diverse systems, notably in the field of engineering. Quantifying energy inputs, outputs, and transformations within a system is part of energy balance, which also entails making sure that the total energy remains constant. Additionally, the goal of studying Energy Balance is to provide students a strong foundation in energy conservation principles and how they are used in engineering systems. It equips students with the skills necessary to assess and improve energy flows, create energy-efficient processes, and support sustainable energy practices. For engineers and other professionals working in industries like energy engineering, environmental engineering, and sustainable development, understanding energy balance is crucial.

Module 22

Code	Course/Module Title	ECTS	Semester
CHEN224	Thermodynamics I	5	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/0/0/1	63	62
Description			
The aim of studying thermodynamics course is to provide students a basic comprehension of the concepts and rules regulating energy, heat transport, and system behavior. An area of physics and engineering called thermodynamics is essential for understanding and forecasting how energy behaves and changes throughout diverse systems. Learning about thermodynamics is meant to provide students a firm grasp of energy, heat transport, and system behavior. It gives students the tools they need to evaluate system performance, analyze and forecast thermodynamic processes, and build effective energy systems. For engineers working in disciplines like mechanical engineering, chemical engineering, energy systems engineering, and environmental engineering, where a thorough comprehension of energy and thermodynamic concepts is necessary. Thermodynamics is crucial for engineers working in disciplines like mechanical engineering, chemical engineering, energy systems engineering, and environmental engineering because these disciplines rely heavily on the design and optimization of sustainable and effective systems, which require a thorough understanding of energy and thermodynamic principles.			

Module 23

Code	Course/Module Title	ECTS	Semester

CHEN223	Environmental Pollution	4	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/0/1	48	52
Description			
The aim of studying environmental pollution is to educate students about the origins, impacts, and prevention measures of environmental contamination. The study of different pollutants and their effects on ecosystems, human health, and the environment as a whole is known as environmental pollution. To enhance students' understanding of the causes, effects, and management of environmental contamination is the overarching goal of studying environmental pollution. It gives students the information and abilities to recognize, evaluate, and reduce pollution-related problems, helping to safeguard the environment and the welfare of current and future generations. Professionals in sectors including environmental science, environmental engineering, public health, and policy-making, where tackling pollution is a priority, must have a solid understanding of environmental contamination. Professionals in sectors including environmental science, environmental engineering, public health, and policymaking need to understand environmental contamination since it is necessary for sustainable development and the preservation of ecosystems.			

Module 24

Code	**Course/Module Title**	**ECTS**	**Semester**
CHEN222	Statistics and Engineering Economics	4	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/1/1	63	37
Description			
The aim of studying statistics and engineering economics is to provide students the knowledge and skills they need to analyze data, make defensible judgments, and assess the viability of engineering projects from an economic standpoint. This course gives students a strong basis for making decisions in engineering applications by fusing statistical analysis with economic ideas. The overall goal of studying statistics and engineering economics is to provide students with the economic and analytical abilities necessary to make wise judgments when working on engineering projects. It gives students the tools they need to analyze data, evaluate risks and uncertainties, estimate costs and benefits of projects, and optimize engineering choices and designs. For engineers and other professionals involved in project management, cost estimating, financial analysis, and decision-making in the engineering. For engineers and other professionals engaged in project management, cost estimating, financial analysis, and decision-making in engineering domains, statistics and engineering economics			

are crucial.

Module 25

Code	Course/Module Title	ECTS	Semester
UOB221	English Language II	4	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/2/0	63	37
Description			
The aim of the English Language II course is to improve students' competency in the language, particularly their reading, writing, speaking, and listening abilities. The overall aim of the English Language II course is to help students improve their communication, critical thinking, and cultural awareness skills. It improves their academic and career prospects, gives them the tools they need to interact with language and literature throughout their lives, and prepares them for successful communication in a variety of circumstances.			

Module 26

Code	Course/Module Title	ECTS	Semester
CHEN316	Thermodynamics II	8	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/3/0/1	109	91
Description			
The aim of studying thermodynamics II is to examine more advanced and specialized issues within the science while also developing a deeper knowledge of the principles and ideas covered in basic thermodynamics I. The complex nature of thermodynamic systems, their behavior, and its applications in numerous technical and scientific fields are explored in depth in Advanced Thermodynamics. Students who study advanced thermodynamics often get a greater comprehension of the concepts, theories, and applications of thermodynamics. It gives students the knowledge and abilities to evaluate intricate thermodynamic systems, forecast their behavior, and use thermodynamic principles to address engineering challenges in the real world. For engineers working in disciplines like chemical engineering, energy systems engineering, materials science, and environmental engineering, advanced thermodynamics is crucial.			

Module 27

Code	Course/Module Title	ECTS	Semester
CHEN315	Heat Transfer I	5	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/0/0/1	63	62
Description			
The aim of the Heat Transfer course is to provide students a thorough grasp of the concepts and mechanisms behind the transmission of thermal energy. It includes researching numerous types of heat transport, including conduction, convection, and radiation, as well as how they are used in diverse contexts. Additionally, the Heat Transfer course will give students a solid foundation in heat transfer theory and its real-world applications. It gives students the information and abilities needed to assess, develop, and optimize thermal systems, address issues with heat transfer, and make contributions to the field's achievements.			

Module 28

Code	Course/Module Title	ECTS	Semester
CHEN314	Mass Transfer I	5	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/0/0/1	63	62
Description			
The Mass Transfer course's aim is to offer a thorough grasp of the methods and concepts involved in the transfer of mass or species across distinct phases, such as gases, liquids, and solids. It includes the investigation of diverse forms of mass transmission, such as diffusion, convection, and mass transfer accompanied by chemical processes. Overall, the goal of the Mass Transfer topic is to give students a solid foundation in mass transfer principles and practical applications. It provides them with the information and abilities needed to understand mass transfer phenomena, create separation procedures, solve mass transfer challenges, and contribute to field advancements.			

Module 29

Code	Course/Module Title	ECTS	Semester
CHEN313	Reactor Design I	5	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/0/0/1	63	62
Description			
Reactor Design courses are designed to provide students a thorough grasp of the concepts, theories, and procedures involved in creating and improving chemical reactors. Reactors are crucial parts of chemical processes where raw materials undergo chemical reactions to produce desired products. Reactor design coursework in chemical engineering is intended to equip students with the information and abilities necessary to plan, evaluate, and improve chemical reactors. The capacity to choose suitable reactor types, size reactors, optimize reaction conditions, and assure safe and effective operation is given to students. Chemical engineers who build, operate, and optimize chemical processes in sectors including petrochemicals, pharmaceuticals, and food processing need to have a solid understanding of reactor design.			

Module 30

Code	Course/Module Title	ECTS	Semester
CHEN312	Engineering Analysis	5	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/0/2	63	62
Description			
The aim of the Engineering Analysis course is to give students the tools and techniques they need to analyze and solve engineering issues using mathematical and computational methodologies. It focuses on the development of analytical abilities as well as mathematical modeling in order to comprehend and predict the behavior of engineering systems. Overall, the aim of the Engineering Analysis topic is to provide students a solid foundation in mathematical and computational tools for analyzing, solving, and optimizing engineering issues. It provides engineers with the skills and information they need to comprehend system behavior, make educated decisions, and create efficient and dependable engineering solutions.			

Module 31

Code	Course/Module Title	ECTS	Semester
CHEN311	Introduction to Nanotechnology	2	5
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/0/0	33	17
Description			
Introduction to Nanotechnology is a cross-disciplinary course that investigates the underlying principles, ideas, and applications of nanotechnology. Nanotechnology is the study and manipulation of nanoscale materials and technologies. The course covers a wide range of topics in nanotechnology, including nanomaterials, nanofabrication techniques, nanodevices, and nanoscale characterisation methods. It stresses the distinct features and processes of materials at the nanoscale that distinguish them from their bulk counterparts. Overall, an Introduction to Nanotechnology course gives students a solid basis for understanding and appreciating the concepts, applications, and prospective effect of nanotechnology in a variety of scientific, technical, and social areas. It acts as a springboard for future study and research in nanoscience and nanotechnology. In general, a course on introduction to nanotechnology gives students a basis for understanding and appreciating the ideas, uses, and prospective effects of nanotechnology in diverse fields of science, technology, and society. It acts as a springboard for more research and study in the area of nanoscience and nanotechnology.			

Module 32

Code	Course/Module Title	ECTS	Semester
CHEN326	Heat Transfer II	7	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/3/0/1	109	66
Description			
Building on the fundamental information learned in Heat Transfer I course, Heat Transfer II studies address increasingly complex and specialized areas of the subject. The complexity of heat transfer systems, their behavior, and their applications in diverse engineering fields are explored in Advanced Heat Transfer. In general, the aim of Heat Transfer II studies is to provide students a deeper comprehension of the underlying ideas, theories, and practical applications of heat transfer. It gives students the knowledge and abilities to comprehend and build intricate heat transfer systems, enhance heat transfer efficiency, and provide original responses to complicated engineering problems.			

Module 33

Code	Course/Module Title	ECTS	Semester
CHEN325	Mass Transfer II	7	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/3/0/1	109	66
Description			
The aim of studying mass transfer II is to investigate more advanced and specialized subjects within the area while also deepening your grasp of the basic mass transfer principles and ideas. Mass Transfer II explores the subtleties of mass transfer processes, their behavior, and its uses across a range of engineering specialties. In general, studying advanced mass transfer is meant to provide students a greater comprehension of the concepts, theories, and uses of mass transfer. It gives students the knowledge and abilities to comprehend intricate mass transfer phenomena, forecast their behavior, and use mass transfer principles to address challenging engineering issues. For engineers working in industries including chemical engineering, environmental engineering, biotechnology, and pharmaceuticals, advanced mass transfer is crucial.			

Module 34

Code	Course/Module Title	ECTS	Semester
CHEN324	Reactor Design II	5	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/0/0/1	63	62
Description			
To get a deeper grasp of the fundamentals of chemical reaction engineering and to investigate more intricate and specialized subjects linked to the design and analysis of chemical reactors, chemical engineers study advanced reactor design. Reactor design I course lay the groundwork for reactor design II, which expands on that knowledge to encompass more complex ideas, types of reactors, and optimization strategies. Overall, the purpose of studying Reactor Design II in chemical engineering is to provide students a deeper comprehension of the ideas, concepts, and methods used in developing and evaluating chemical reactors. It gives students the know-how and abilities to deal with challenging reactor design issues, enhance reactor performance, and support the creation of novel and environmentally friendly chemical processes.			

Module 35

Code	Course/Module Title	ECTS	Semester
CHEN323	Gas Technology	3	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/0/0	33	42
Description			
The study of the generation, handling, and usage of gases, particularly in industrial applications, is the emphasis of Gas Technology. The aim of the Gas Technology course is to educate students with a thorough grasp of many elements of gas production, characteristics, storage, transportation, and applications. Also, the aim of the Gas Technology course is to provide students with the information and abilities required to work with gases in a variety of industrial contexts. Students get a grasp of gas production techniques, gas characteristics, gas storage and transit technologies, and gas applications. This expertise equips them for positions in the energy, oil and gas, chemical engineering, environmental engineering, and sustainable technologies industries. Furthermore, the topic promotes knowledge of the environmental and sustainability concerns linked with gas technology, motivating students to investigate cleaner and more efficient methods of utilizing gases.			

Module 36

Code	Course/Module Title	ECTS	Semester
CHEN322	Mathematical Modeling	5	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/0/2	63	62
Description			
The course of mathematical modeling aims to improve students' ability to create mathematical models that explain and examine occurrences in the actual world. Mathematical modeling is the act of representing, comprehending, and predicting the behavior of complex systems or processes using mathematical equations, concepts, and procedures. In general, the aim of studying mathematical modeling is to provide students a strong toolkit for deciphering and comprehending intricate systems in a variety of disciplines, including engineering, physics, biology, economics, and environmental sciences. It seeks to improve students' analytical, problem-solving, and critical thinking abilities, empowering them to meet issues in the real world by creating and delving into mathematical models.			

Module 37

Code	Course/Module Title	ECTS	Semester
CHEN321	Numerical Methods	3	6
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	0/2/0/0	48	27
Description			
In order to address mathematical problems that are challenging or impossible to answer analytically, students studying numerical methods are given a foundation in numerical approaches and algorithms. Numerical approaches entail employing computational tools and methods to approximate the solutions. The goal of the course is to provide students the knowledge and abilities they need to use numerical methods correctly and successfully in a range of scientific, engineering, and mathematical applications. The overall aim of studying numerical methods is to provide students the knowledge and abilities required to use computational approaches to solve challenging mathematical issues. In order to ensure correct and effective numerical solutions in a variety of scientific and technical applications, it strives to improve students' capacity to evaluate, implement, and use numerical algorithms.			

Module 38

Code	Course/Module Title	ECTS	Semester
CHEN416	Unit Operations	7	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/3/0/1	109	66
Description			
The purpose of the Industrial Units course is to provide students a thorough grasp of the numerous industrial processes and units utilized in the chemical industry and other related sectors. The purpose of this course is to introduce students to the planning, carrying out, and optimization of various unit operations and unit processes applied in industrial settings. A thorough foundation in the concepts, design, and operation of industrial units and processes is what students should expect from their study of industrial units in chemical engineering. It seeks to improve their capacity to assess, optimize, and manage unit operations and processes in the chemical and associated sectors in a safe, effective, and sustainable way.			

Module 39

Code	Course/Module Title	ECTS	Semester
CHEN415	Petroleum Refining I	6	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/0/0/1	63	87
Description			
The purpose of studying the course of petroleum Refining I is to provide students a thorough grasp of the procedures, methods, and activities involved in converting crude oil into valuable petroleum products. The purpose of this course is to acquaint students with the different refining procedures, unit operations, and machinery utilized in the petroleum refining sector. Also, the overall aim of studying Petroleum Refining I is to provide students a thorough grasp of the procedures, technologies, and processes involved in converting crude oil into worthwhile petroleum products. It aims to give students the information and abilities required to operate in the petroleum refining business, contribute to process optimization, deal with environmental issues, and keep up with upcoming trends and technology in the industry.			

Module 40

Code	Course/Module Title	ECTS	Semester
CHEN414	Equipment Design	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/0/0/1	63	62
Description			
The aim of studying the subject of equipment design I is to provide students a thorough grasp of the concepts, procedures, and factors that go into designing equipment for use in chemical processes. Students will gain the information and abilities needed to design, choose, and size several types of equipment utilized in chemical engineering applications in this course. Ensuring that students have the knowledge and abilities to design, choose, and size equipment utilized in chemical processes is the overall aim of the Equipment Design course in chemical engineering. It seeks to improve their capacity to use engineering concepts, take into account economic and safety considerations, and contribute to the creation of dependable and efficient equipment designs for a variety of industrial applications.			

Module 41

Code	Course/Module Title	ECTS	Semester
CHEN413	Chemical and Petrochemical Industries	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/0/2	63	62
Description			
Providing students with a thorough grasp of the chemical and petrochemical industries, including their processes, technology, products, and difficulties, is the aim of the Chemical and Petrochemical Industries topic. The purpose of this course is to acquaint students with the creation, administration, and operation of chemical and petrochemical facilities as well as the regulatory, economic, and environmental elements of these sectors. The Chemical and Petrochemical businesses course is designed to provide students a thorough grasp of these businesses, their procedures, goods, and difficulties. It seeks to increase their capacity for analysis, evaluation, and contribution to the chemical and petrochemical industries' sustainable development. Students will learn about industry norms, rules, and new trends that will equip them for employment in these vital and dynamic sectors.			

Module 42

Code	Course/Module Title	ECTS	Semester
CENG412	Engineering Project I	5	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
0	0/3/2/0	78	47
Description			
Engineering Project I is a course designed to provide students hands-on experience in organizing, carrying out, and managing engineering projects. This course intends to help students improve their problem-solving, communication, teamwork, and project management abilities while also creating an overall awareness of the project lifecycle. The aim of the Engineering Project I course is to equip students with the real-world project management knowledge and experience needed to succeed in their engineering professions. In addition to encouraging cooperation, problem-solving, communication, and ethical decision-making, it seeks to build students' capacity for efficient planning, execution, and management of engineering projects.			

Module 43

Code	Course/Module Title	ECTS	Semester
CHEN411	Sustainable Engineering	2	7
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	0/0/0/1	33	17
Description			
The course delves into numerous areas of sustainability, such as energy efficiency, resource conservation, waste management, pollution avoidance, and social equality. It stresses the incorporation of sustainability concepts throughout the engineering lifespan, from idea and design to construction, operation, and decommissioning. Students studying Sustainable Engineering get an awareness of the environmental impact of engineering operations and learn ways to reduce negative consequences while enhancing positive contributions to sustainability. They learn to examine the life cycle of engineering systems and assess their environmental, economic, and social implications. Also, Sustainable Engineering prepares students to design and execute engineering solutions that promote sustainability and contribute to a more ecologically conscious and socially equitable world. It trains engineers to be change agents capable of addressing the pressing concerns of global sustainability and making a positive influence via their profession.			

Module 44

Code	Course/Module Title	ECTS	Semester
CHEN426	Process Control	8	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
3	0/3/0/1	109	91
Description			
The process control course is designed to provide students with a thorough grasp of the concepts, methods, and procedures involved in managing and improving chemical processes. To keep desired process variables within a predetermined range and ensure the secure, effective, and dependable functioning of chemical processes, process control entails the use of engineering concepts and control systems. The knowledge and abilities required to build, evaluate, and optimize control systems for chemical processes are what students who study process control in chemical engineering want to gain from their studies. It seeks to improve students' abilities to regulate and automate processes effectively in order to assure process safety, increase process efficiency, and achieve product quality criteria. Understand the reason behind studying process control in chemical engineering and its main applications.			

Module 45

Code	Course/Module Title	ECTS	Semester
CHEN425	Petroleum Refining II	6	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/2/0/1	79	71
Description			
Students who take the course of Petroleum Refining II will have a thorough grasp of the subject's intricate and specialized facets. This course expands on the fundamental information learned in Petroleum Refining I by exploring more complex ideas, cutting-edge technology, and industry difficulties. In addition, the overall goal of the advanced Petroleum Refining II course is to provide students with specialized knowledge and abilities in challenging and niche areas of petroleum refining. It seeks to increase their comprehension of cutting-edge refining techniques, technologies, optimization tactics, environmentally sound practices, and safety issues particular to the petroleum sector. In the field of advanced petroleum refining, students will be equipped to deal with problems, contribute to the creation of creative solutions, and make defensible choices.			

Module 46

Code	Course/Module Title	ECTS	Semester
CENG424	Engineering Project II	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
0	0/3/2/0	78	47
Description			
The Engineering Project II is a continuation of the Engineering Project I. The Engineering Project II is designed to help students get a better grasp of complicated engineering projects II by building on the fundamental information and abilities they learned in prior project course. The advanced project management, critical thinking, creativity, and leadership skills that are required to handle complex engineering projects are the focus of this course.			

Module 47

Code	Course/Module Title	ECTS	Semester

CHEN423	Electrochemical Engineering	4	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	0/0/0/0	33	67
Description			
The aim of the Electrochemical Engineering course is to equip students with a thorough grasp of electrochemistry concepts, processes, and applications in engineering systems. The study of electrochemical processes, energy conversion and storage, corrosion avoidance, and the design and optimization of electrochemical devices and systems are all topics covered in electrochemical engineering. Furthermore, Electrochemical Engineering course is to give students the information and skills they need to evaluate, develop, and optimize electrochemical systems and processes. Students gain a grasp of electrochemistry's fundamental concepts, electrochemical processes, and the behavior of electrochemical cells and devices. They are taught how to use this knowledge to solve engineering challenges, improve electrochemical processes, and create electrochemical systems for specific applications. Energy, environmental engineering, materials science, electronics, and chemical production are among businesses that use electrochemical engineering.			

Module 48

Code	**Course/Module Title**	**ECTS**	**Semester**
CHEN422	Computer Applications	5	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	0/3/0/1	78	47
Description			
The purpose of learning computer applications is to acquaint students with the underlying ideas behind programming and the use of the MATLAB programming language to solve computational problems. In this course, students will learn how to use MATLAB, a robust program for numerical calculations, algorithm building, and data analysis. The overall goal of learning Computer Applications with MATLAB is to provide students the skills and knowledge they need to effectively utilize MATLAB for data analysis, numerical calculations, algorithm creation, and simulation. Its goal is to help students become more proficient with MATLAB, a flexible tool for scientific and engineering applications, and to improve their computational thinking and problem-solving skills. Chemical process simulation aims to represent a process of chemical or physical transformation through a mathematic model that involves the calculation of mass and energy balances coupled with phase equilibrium and with transport and chemical kinetics equations. All this is made looking for the			

establishment (prediction) of the behaviour of a process of known structure, in which some preliminary data of the equipment that compose the process are known. The student will learn how to transform a PFD into a PSD through a series of lectures starting from individual process units and finally ending with a complete plant simulation. This will include the determination of the size of the equipment and piping, evaluate costs, and optimize performance.

Module 49

Code	**Course/Module Title**	**ECTS**	**Semester**
UOB421	Engineering Ethics	2	8
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	0/0/1/0	33	17
Description			
The aim of studying Profession ethics is to provide students a firm grasp of the ethical ideals and concepts that are necessary for professional conduct in their chosen sector. Students' ethical reasoning and decision-making abilities, as well as their understanding of ethical concerns and obligations they may confront in their professional careers, are all things this course tries to help them with. Additionally, the aim of studying professional ethics is to equip students with the skills necessary to handle the complex ethical issues and obstacles they can face in the workplace.			

8. Contact

Program Manager:

Dr. Mudhaffar Hussein | PhD in Chemical Engineering | Assist Professor

Email: myhussein2017@uomisan.edu.iq

Mobile no.: +9647801857780

Program Coordinator:

Dr. Ali Hussein | Ph.D. in Materials Engineering | Lecturer

Email: al_azzawwi@uomisan.edu.iq

Mobile no.: +9647702690816