دليل

اعتماد مسار بولونيا في

كلية الفارابي الجامعة - قسم هندسة تكرير النفط والغاز

Petroleum and Gas Refinery Engineering

Bachelor's Degree (B.Sc.)

بكالوريوس

Republic of Iraq - Ministry of Higher Education and		العلمي والبحث العالي التعليم وزارة - العراق جمهورية
Al-Farabi University College		كلية الفارابي الجامعة
Bachelor's degree in Petroleum and Gas Refinery Eng.		بكالوريوس في هندسة تكرير النفط والغاز
Four years (Eight semesters) - 240 ECTS credits - 1 ECTS		٢٥ = اوربية وحدة كل - اوربية وحدة ٢٤٠ - (دراسية فصول ثمانية) سنوات أربع
Program Curriculum (2023 - 2024)		٢٠٢٣-٢٠٢٤ للعام الدراسي المنهاج

Level	Semester	No.	Module Code	Module Name in English	الدراسية المادة اسم	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/se	USSWL hr/sem	SWL hr/se	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
	One	1	TEE	Technical English	الانكليزية اللغة	Engli	4						3	63	37	100	4.0	S	
		2	GEM	General Mathematics	العامة الرياضيات	Engli	2				1		3	48	102	150	6.0	B	
		3	ANC	Analytical Chemistry	التحليلية الكيمياء	Engli	2		2				3	63	87	150	6.0	B	
		4	PHS	Physics and Strength of	الفيزياء ومقاومة	Engli	4				1		3	78	72	150	6.0	B	
		5	COS	Computer Science	الحاسوب علوم	Engli	1		2				3	48	52	100	4.0	B	
		ش	WOS	Workshops	المعامل	Arabi				6			3	93	7	100	4.0	B	
						Total	13	0	4	6	2	0	18	39	357	750	30.		

UGI	Semester	No.	Module Code	Module Name in English	الدراسية المادة اسم	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/se	USSWL hr/sem	SWL hr/se	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
	Two	1	DIIN1	Differentiation and Integration	التفاضل والتكامل	Engli	2				1		3	48	102	150	6.0	B	
		2	CHE	Chemical Engineering	الهندسة مبادئ	Engli	3				1		3	63	87	150	6.0	C	
		3	CHP	Chemistry of Petroleum	البترول كيمياء	Engli	2		2				3	63	87	150	6.0	B	
		4	EDA	Engineering Drawing and	الهندسي الرسم و	Engli	2		4				3	93	57	150	6.0	B	
		5	HUR	Human Rights and	الإنسان حقوق	Arabi	2						3	33	17	50	2.0	S	
		6	WOS	Workshops	المعامل	Arabi				6			3	93	7	100	4.0	B	
						Total	11	0	6	6	2	0	18	39	357	750	30.		

Note: The student should complete 4 weeks of Summer Internships to fullfil the requirements of the Bachelor of Science degree

Structured SWL (hr/w) type			Module type			SWL:	Student
	CL	Class Lecture		B	Basic learning		
	La	Laboratory		C	Core learning activity	SSWL:	Structured SWL
	Pr	Practical Training		S	Suport or related	USSWL:	Unstructured
	Tu	Tutorial		E	Elective learning		
	Le	Online lecture					
	Se	Seminar					

Al-Farabi University College

Petroleum and Gas Refinery Eng

كلية الفارابي الجامعة

قسم هندسة تكرير النفط والغاز

Bachelor's Degree (B.Sc.) بكالوريوس

Table of Contents | جدول المحتويات

1. Mission & Vision Statements

Vision Statement of Petroleum and Gas Refinery Engineering

Preparing chemical engineers with high scientific competence and skills to contribute to the development of the petroleum refinery region, gas technology and petrochemical industries in order to enhance the national economy.

Mission Statement of Petroleum and Gas Refinery Engineering

Providing the oil refining region with chemical engineers from B.Sc and M.Sc graduates who are able to work with full responsibility and skill according to the latest scientific programs in the field of chemical engineering.

2. Program Specification

Program code:	Bsc- CES.RE	ECTS	240
Duration:	4 levels, 8 Semesters	Methods of Attendance	Full Time

The program's educational objectives align harmoniously with the mission statements of both the Al-Farabi university college and the petroleum & Gas refinery engineering Department. These statements reflect shared educational values, emphasizing the graduation of students who possess professional competence, leadership qualities, and the ability to work effectively as part of a team in various scenarios. Additionally, the program aims to instill in students an understanding of the significance of their work, not only to their own development but also to the betterment of society as a whole. The curriculum of the program has been intentionally structured into three key categories of courses:

i. **General Engineering (Engineering Science and Engineering Design):** These courses are standard for most undergraduate engineering students and provide instruction in fundamental engineering principles. They serve as an introduction to engineering basics and serve as a complement to the mathematics and basic sciences that students encounter prior to or concurrently with these courses. The general engineering courses swiftly establish the context for the mathematics and basic sciences that students may find challenging to fully grasp and appreciate.

ii. **Basic Mathematics and Science:** Students in the undergraduate program are required to complete extensive coursework in Mathematics, Chemistry, Physics, Engineering Drawing, Computer

Programming, AutoCAD, Eng. Statistics, Numerical Analysis, Engineering Mechanics & Strength of Materials, Chemical Reaction Kinetics, and Basic Principles of Chem. Eng.

iii. **General Education:** These are largely university requirements, but also support engineering student outcomes. These courses provide the student with the knowledge and skills required to appreciate the global perspective of engineering and to be prepared in technical communications. They also include courses to broaden the horizons of the student and provide opportunities for service learning.

3. Program Goals

General objectives of the Chemical Engineering Department:

1. Preparing engineers specialized in the fields of chemical engineering to meet the needs of the labor market by training them on modern technologies, theoretical engineering skills, and practical laboratories that simulate industrial reality. On the other hand, encouraging and supporting them during preparation periods to prepare designs for productive industrial projects and to use information sources and modern scientific programs.
2. Supporting scientific research and discreet global publishing in international journals, and enhancing the spirit of scientific honesty and accuracy in conducting experiments and laboratory tests.
3. Developing and strengthening postgraduate programs, recognizing their significance as a vital contributor to the advancement of scientific research. These programs serve as a crucial channel to stay abreast of the latest scientific developments happening worldwide. By offering postgraduate opportunities, we aim to foster a culture of

continuous learning and ensure that our faculty and students remain at the forefront of scientific knowledge and innovation.

4. Enhancing the department's leading role in community service and the labor market, supporting the national industry.
5. Enhancing financial resources by conducting research, academic work, and knowledge commercialization initiatives that contribute to the country, university, and department's financial sustainability.

Objectives of the Petroleum and Gas Refinery Engineering

1. Preparing chemical engineers with the ability to have a wide range of knowledge to work in the field of petroleum refineries, petrochemical industries, gas industry, and other related operations.
2. Providing the graduate with scientific and industrial skills that enable him to keep pace with the technological development to work in the field of petroleum refineries and gas technology through the advanced industrial laboratories in the department, as well as advanced computer programs in the field of industrial designs and simulations.
3. Developing joint scientific research in areas that serve the industrial and productive region in the petroleum and gas sector through solving industrial problems and community service.
4. Focusing on the scientific publication of distinguished scientific research by the branch professors and researchers to reach the advanced international classifications that reflect the distinguished scientific weight of the Department of Petroleum and Gas Refinery Engineering and Alfarabi university college

4. Student learning outcomes

The graduate attributes have been adopted as Program Learning Outcomes (PLOs) of the Chemical and Refinery Engineering program and approved by department.

Following is the list of Program Learning Outcomes (PLO) that graduates of the Chemical and Refinery Engineering Program will attain while they are at Alfarabi university college.

Outcome 1

Mathematics, Science, Problem solving

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

Outcome 2

Design/Development of Solutions

An ability to apply the engineering design process to produce solution that meet specified needs with consideration for public health and safety, and global, cultural, social, environmental, economic, and other factors as appropriate to the discipline.

Outcome 3

Experimentation work

An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

Outcome 4

Communication

An ability to communicate effectively with a range of audiences.

Outcome 5

Ethics, Broad education

An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solution in global, economic, environmental, and societal contexts.

Outcome 6

Long-life learn, Contempt Topics, Eng. tool

An ability to recognize the ongoing need to acquire new knowledge, to choose appropriate learning strategies, and to apply this knowledge.

Outcome 7

Teamwork

An ability to function effectively as a member or leader of a team that establishes goals, plans tasks, meets deadlines, and creates a collaborative teams and inclusive environment.

5. Academic staff

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6. Credits, Grading and GPA

Credits

Al-Farabi University college- Iraq 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 (%)	Definitions

Success Group (50-100)	A-Excellent	امتياز	90-100	Outstanding Performance
	B- Very Good	جيد جداً	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:				
Marks with decimal places above or below 0.5 will be rounded up or down to the nearest whole number (for example a mark of 54.5 will be rounded to 55 ,whereas a mark 54.4 will be rounded to 54. The University has policy NOTE to condone "near –pass fail" 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)

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. degrees:

CGPA= [($1^{st.}$ module score × ECTS) + ($2^{nd.}$ module score × ECTS) + ($3^{rd.}$ module score × ECTS) + ($4^{th.}$ module score × ECTS)] /240

7. Curriculum/Modules

Semester 1 | 30 ECTS|1 ECTS = 25 hrs.

No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
					CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
1	TEEN111	Technical English	اللغة الانكليزية التقنية	English	4						3	63	37	100	4.00	S	
2	GEMA112	General Mathematics	الرياضيات العامة	English	2				1		3	48	102	150	6.00	B	
3	ANCH113	Analytical Chemistry	الكيمياء التحليلة	English	2		2				3	63	87	150	6.00	B	
4	PHSM114	Physics and Strength of Materials	الفيزياء ومقاومة المواد	English	4				1		3	78	72	150	6.00	B	
5	COSC115	Computer Science	علوم الحاسوب	English	1		2				3	48	52	100	4.00	B	
6	WOSH116	Workshops	المعامل	Arabic				6				93	7	100	4.00	B	
				Total	13	0	4	6	2	0	15	390	360	750	30.00		

Semester 2 | 30 ECTS|1 ECTS = 25 hrs.

No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
					CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
1	DIIN121	Differentiation and Integration	التفاضل والتكامل	English	2				1		3	48	102	150	6.00	B	
2	CHEP122	Chemical Engineering Principles	مبادئ الهندسة الكيمياوية	English	3				1		3	63	87	150	6.00	C	
3	CHPE123	Chemistry of Petroleum	كيمياء البترول	English	2		2				3	63	87	150	6.00	B	
4	EDAU124	Engineering Drawing and AutoCAD	الرسم الهندسي و الاوتوكاد	English	2		4				3	93	57	150	6.00	B	
5	HURD125	Human Rights and Democracy	حقوق الانسان والديمقراطية	Arabic	2						3	33	17	50	2.00	S	
6	WOSH116	Workshops	المعامل	Arabic				6				93	7	100	4.00	B	
				Total	11	0	6	6	2	0	15	390	360	750	30.00		

Note: The student should complete 4 weeks of Summer Internships to fullfil the requirements of the Bachelor of Science degree								
Structured SWL (hr/w) type	**CL**	Class Lecture	**Module type**	**B**	Basic learning activities		**SWL:**	Student Workload
	Lab	Laboratory		**C**	Core learning activity		**SSWL:**	Structured SWL
	Pr	Practical Training		**S**	Suport or related learning activity		**USSWL:**	Unstructured SWL
	Tut	Tutorial		**E**	Elective learning activity			
	Lect	Online lecture						
	Semn	Seminar						

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Al-Farabi University College
Petroleum and Gas Refinery Engineering

كلية الفارابي الجامعة
قسم هندسة تكرير النفط والغاز

Bachelor's Degree (B.Sc.) بكالوريوس

Table of Contents

1. Overview

This catalogue is about the courses (modules) given by the program of Chemical Engineering - Petroleum Refinery 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 عامة :

يتناول هذا الدليل المواد الدراسية التي يقدمها قسم هندسة تكرير النفط والغاز للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (48) مادة دراسية مع (6000) إجمالي ساعات حمل الطالب و 240 إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

Module 1

Code	Course/Module Title	ECTS	Semester
TEEN111	Technical English	4	1
Class (hr/w)	**Lec./Lab./Prac./Tut. (hr/w)**	**SSWL (hr/sem)**	**USWL (hr/sem)**
4	0	63	37
Description			
This course aims to improve students' English language skills through a two-part approach. The first part focuses on developing practical communication abilities, including listening, speaking, reading, and writing. Students will engage in interactive exercises to enhance their ability to effectively communicate in English. The second part concentrates on building knowledge of language structure, including pronunciation, vocabulary, and grammar. Through clear instruction and practice, students will enhance their understanding and application of these essential language components. By the end of the course, students will have improved their language skills and acquired a strong foundation in both practical communication and language structure in English.			

Module 2

Code	Course/Module Title	ECTS	Semester
GEMA112	General Mathematics	6	1
Class (hr/w)	**Lec./Lab./Prac./Tut. (hr/w)**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	1 (Tut.)	48	102
Description			
This course offers students a solid mathematical foundation and equips them with quantitative skills applicable across various disciplines. It covers essential topics such as functions, limits, special functions, derivatives, different types of derivative solutions, and the chain rule. Students will not only gain a comprehensive understanding of these concepts but also learn how to apply them in practical scenarios. By the end of the course, students will have developed a strong mathematical background and acquired the ability to utilize these mathematical principles effectively.			

Module 3

Code	Course/Module Title	ECTS	Semester
ANCH113	Analytical Chemistry	6	1
Class (hr/w)	**Lec./Lab./Prac./Tut. (hr/w)**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2 (Lab.)	63	87
Description			
This course focuses on enhancing students' proficiency in analytical chemistry by covering key principles. Students will delve into the fundamentals of atoms, molecules, quantitative analysis, and transition metal chemistry. Additionally, they will explore spectroscopic techniques extensively employed in various chemical engineering disciplines. By studying these spectroscopic techniques, students will gain a solid foundation that will prove valuable in their pursuit of other chemical engineering courses. Through a combination of theoretical knowledge and practical applications, students will develop essential analytical chemistry skills that are applicable in real-world scenarios.			

Module 4

Code	Course/Module Title	ECTS	Semester
PHSM114	Physics and Strength of Materials	6	1
Class (hr/w)	**Lec./Lab./Prac./Tut. (hr/w)**	**SSWL (hr/sem)**	**USWL (hr/sem)**
4	1 (Tut.)	78	72
Description			
This course is divided into two parts. The first part focuses on providing students with a comprehensive understanding of fundamental physics concepts, laws, and processes. It aims to develop their knowledge of the underlying principles that govern the physical world. The second part of the course delves into the field of Strength of Materials. Students will study topics such as equilibrium of force systems, moments of forces, centroids and centers of gravity, analysis of internal forces, strains, stress-strain diagrams, Hook's law, shearing deformation, Poisson's ratio, volumetric strain, thin-walled cylinders, thermal stress, and shear and bending moment in beams. Through theoretical explanations and practical examples, students will gain a solid foundation in both physics and the behavior of materials. By the end of the course, students will possess the necessary skills to analyze and understand various physical phenomena and the strength characteristics of materials.			

Module 5

Code	Course/Module Title	ECTS	Semester
COSC115	Computer Science	4	1
Class (hr/w)	**Lec./Lab./Prac./Tut. (hr/w)**	**SSWL (hr/sem)**	**USWL (hr/sem)**
1	2 (Lab.)	48	52
Description			
This course provides students with a comprehensive overview of computer operating systems, including different types and smartphone systems. It covers Windows and Microsoft Office, with a specific focus on Microsoft Excel. Additionally, students will learn Visual Basic programming language, emphasizing the design environment and user interface elements. The course also introduces fundamental programming concepts in Visual Basic, including traditional and basic programming principles. Students will gain practical knowledge in designing and planning programs. By the end of the course, students will have a solid understanding of computer operating systems, proficiency in Microsoft Office applications, familiarity with Visual Basic programming, and the ability to design and plan effective programs.			

Module 6

Code	Course/Module Title	ECTS	Semester
WOSH106	Workshops	4	1
Class (hr/w)	**Lec./Lab./Prac./Tut. (hr/w)**	**SSWL (hr/sem)**	**USWL (hr/sem)**
0	6 (Prac.)	93	7
Description			
This course focuses on enhancing students' practical technical expertise through hands-on workshops. The objective is to prepare highly knowledgeable and technologically creative applied engineers. Emphasis is placed on operating in accordance with globally adopted quality assurance standards while upholding the ethical principles of the engineering profession. Students will gain an understanding of work systems, associated risks, and relevant factors. Additionally, theoretical principles in craftsmanship and measurements will be covered. By the end of the course, students will have developed practical skills, a strong knowledge base, and the ability to apply theoretical principles effectively in real-world engineering scenarios while adhering to professional ethics.			

Module 7

Code	Course/Module Title	ECTS	Semester
DIIN121	Differentiation and Integration	6	2
Class (hr/w)	**Lec./Lab./Prac./Tut. (hr/w)**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	1 (Tut.)	48	102
Description			
The primary goal of this course is to facilitate student comprehension of fundamental mathematical concepts, such as differentiation, integration, various integration methods, definite integrals, and their applications. Additionally, the course covers topics like polar coordinates, vector analysis, determinants, and matrices. The intention is to equip students with the necessary skills to employ mathematical methods effectively as problem-solving tools in engineering contexts. By the end of the course, students will have developed a solid foundation in these mathematical techniques, enabling them to apply them confidently and proficiently to address engineering challenges.			

Module 8

Code	Course/Module Title	ECTS	Semester
CHEP122	Chemical Engineering Principles	6	2
Class (hr/w)	**Lec./Lab./Prac./Tut. (hr/w)**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	1 (Tut.)	63	87
Description			
The primary objective of this course is to enhance the skills of chemical engineering students in comprehending the fundamental concepts and expressions in the field. The course focuses on teaching calculations related to chemical reactions, material balance, gases, and vapors. Students will learn how to perform calculations involving chemical reactions, and understand the principles of material balance to track the flow of substances in chemical processes. By the end of the course, students will have acquired the necessary knowledge and skills to effectively apply these calculations and concepts in the context of chemical engineering.			

Module 9

Code	Course/Module Title	ECTS	Semester
CHPE123	Chemistry of Petroleum	6	2
Class (hr/w)	**Lec./Lab./Prac./Tut. (hr/w)**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2 (Lab.)	63	87
Description			
This course is designed to enhance students' skills in the field of petroleum chemistry and organic compounds. It covers various topics, including an introduction to organic compounds, their preparation methods, and their reactions. The course specifically explores areas such as carbohydrates, polymers, and dyes. By delving into these subjects, students gain a deeper understanding of the key technical concepts that form the basis of chemical engineering, with a focus on their chemistry-related aspects. Through this course, students can develop the necessary knowledge and skills to apply petroleum chemistry and organic compound principles in the context of chemical engineering.			

Module 10

Code	Course/Module Title	ECTS	Semester
EDAU124	Engineering Drawing and AutoCAD	6	2
Class (hr/w)	**Lec./Lab./Prac./Tut. (hr/w)**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	4 (Lab.)	93	57
Description			
This course consists of two parts. In the first part, students will develop skills in engineering drawing, including applications, analysis models, sections, and projections. They will also learn to create isometric and oblique views. The second part introduces students to AutoCAD, covering components and commands like point, lines, rectangle, polygon, polyline, and arc for 2D engineering drawings. They will also explore modify commands, layer organization, and 3D drawing methods. By the end of the course, students will possess practical expertise in engineering drawing techniques and a solid grasp of AutoCAD's capabilities for creating 2D and 3D engineering drawings.			

Module 11

Code	Course/Module Title	ECTS	Semester
HURD125	Human Rights and Democracy	2	2
Class (hr/w)	**Lec./Lab./Prac./Tut. (hr/w)**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	33	17
Description			
This course encompasses two main parts. The first part focuses on the concept of human rights, encompassing their characteristics, the role of human rights groups, and their interconnectedness with other concepts. Students will gain a comprehensive understanding of the fundamental principles and values that underpin human rights. In the second part, students will delve into the study of democracy, examining its historical context, its relationship with religions and development, as well as analyzing the advantages and disadvantages associated with democratic systems. By the end of the course, students will have acquired a deep knowledge of human rights and democracy, enabling them to critically evaluate and navigate these concepts within societal contexts.			

Module 12

Code	Course/Module Title	ECTS	Semester
WOSH106	Workshops	4	2
Class (hr/w)	**Lec./Lab./Prac./Tut. (hr/w)**	**SSWL (hr/sem)**	**USWL (hr/sem)**
0	6 (Prac.)	93	7
Description			
This course focuses on enhancing students' practical technical expertise through hands-on workshops. The objective is to prepare highly knowledgeable and technologically creative applied engineers. Emphasis is placed on operating in accordance with globally adopted quality assurance standards while upholding the ethical principles of the engineering profession. Students will gain an understanding of work systems, associated risks, and relevant factors. Additionally, theoretical principles in craftsmanship and measurements will be covered. By the end of the course, students will have developed practical skills, a strong knowledge base, and the ability to apply theoretical principles effectively in real-world engineering scenarios while adhering to professional ethics.			

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	Ministry of Higher Education and Scientific Research - Iraq Al-Farabi University College Petroleum and Gas Refinery Eng.	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Technical English		**Module Delivery**		
Module Type	Support or related learning activity		☒ **Theory** ☒ **Lecture**		
Module Code	TEEN111				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level	1		**Semester of Delivery**	1	
Administering Department	CES.PR		**College**	CES	
Module Leader	Dr. kahlidah Abd Alkhaliq Jafar		**e-mail**	dr.kahlidah.alqayim@alfarabiuc.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	PhD	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Asst.Prof..Dr. abdulfattah Mohamed Ali		**e-mail**	abdulfatah.mohamed@alfarabiuc.edu.iq	
Scientific Committee Approval Date			**Version Number**	1	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This module aims to enhance the communication skills of students whose English language level is equivalent to the first-year undergraduate students in the Chemical Engineering Department. There will be a particular focus on developing the four language skills (speaking, listening, reading and writing) and on broadening students' vocabulary and grammatical range so that they can communicate easily on a wide range of topics. In addition, to teaching the technical English vocabulary that the student needs in his/her academic engineering studies and in his/her professional life as a chemical engineer in factories.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The course covers the core language and skills students need to communicate successfully in engineering specializations. 2. Express their opinions and participate in discussions on a wide range of topical issues. 3. Communicate effectively in written format on a range of contemporary topics, especially the technical ones. 4. Understand the key points of a range of moderately complex oral and written texts with relative ease. 5. Communicate effectively as part of a multicultural group. 6. Manage, interpret and create meaning using a variety of digital devices and tools. 7. An accurate description of the nature of the vocabulary and expressions used by chemical engineers in dealing with their fields of specialization, and then trying to simulate that in writing reports, expression, and formulating simple and complex sentences.
Indicative Contents المحتويات الإرشادية	**A- Communicative competences** **Listening** - Understand and identify the main points of dialogues of 230-250 words on familiar topics that are regularly encountered in life, work, university, etc., within the scope of the syllabus. - Listen and guess the meanings of speakers' expressions and feelings in monologues and familiar conversations in everyday life. - Understand the main points of news programs, broadcasts, interviews, etc., on familiar topics given clearly, in simple language, or with illustrative images (pictograms). **Speaking** – Pronunciation of short dialogues clearly and accurately. - Speak and interact with fellow speakers about familiar topics, express personal points of view and share information on topics covered in the curriculum. - Describe in simple discourse familiar topics while telling a short story related to the topics covered. – Presenting projects related to curriculum topics in an accurately prepared manner. **Reading** - Read and comprehend the main points and specific contents of a 200-word text on current and familiar topics. - Read and understand the flow of argument for texts, identify key conclusions in texts using plain language. - Reading to find and summarize short texts for daily use, including those related to the work of the chemical engineer, such as excerpts from scientific books, and the use of words and structures from the original texts. **Writing** – write paragraphs (i.e., block and indented styles), Write simple connected and coherent texts of 180-200 words; write short reports based on suggestions, providing factual information and reasons for recommendations in the reports; collect short information from several sources and summarize it. - Complete (write/fill)

	administrative forms such as CVs and resumes, employment application letter, emails, etc. - Write descriptive texts for simple charts and tables. **B- Linguistic knowledge** - **Pronunciation**: Vowel and consonant syllable, words with different syllables, Words with stress (specials cases) – Words without stress, Sentence stress, comprehension (assimilation), linking vowels with question vowels, intonation, homophones, practice words and terms, phrases, and sentences related to the students' specialization. - **Vocabulary**: Words related to themes and topics of the course, collocations, words with different meanings and pronunciations. - **Grammar**: parts of speech, past, present, and future tenses, word structure (i.e., compound nouns), countable and uncountable nouns. Types on sentences: simple, compound, complex sentences, articles, linguistic function: commands, requests, offers, advice and instructions. Modal verbs, relative pronouns and relative clauses with which-that-who-whom-whose-where-when. Prepositions, Phrasal verbs including verbs, adverbs and prepositions, comparison showing changing things, sentences of reason and results and conjunctions: although, however etc, active and passive, adverbial clauses of condition, comparatives and superlatives of adjectives.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**Students are taught through Communicative language teaching (CLT)** in which students are encouraged to communicate with each other in the target language. Students need to be as familiar with the target language as possible in order to understand and use it in real-life situations. A variety of ways are also utilized to teach students technical English language in the field of chemical engineering. For example, work in group, practicing various activities, discussion, and presentation to make students communicate with each other in the target language and practice using the target language to communicate. Students need to be confident in their ability to use the target language and to develop better interpersonal skills.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	5 % (5)	5, 10	LO #1, 2,
	Assignments	15	5 % (5)	All weeks	LO # 3, 4, 6 and 7
	Oral evaluation	2	5% (10)	7	All
	Written& spoken evaluation	continuous	5% (10)	All	All
Summative assessment	**Midterm Exam**	1.5 hr	10% (10)	14	LO # 1-5
	Final Exam	3hr	70 % (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Parts of Speech** (nouns – verbs – adjectives – adverbs – prepositions – articles - pronouns- conjunctions - interjections)
Week 2	The components, structure and kinds of the sentences 1- Simple - compound - complex 2- Declarative - interrogative - exclamatory - imperative
Week 3	Tenses - present tenses, definite and indefinite articles, ways of joining sentences
Week 4	Tenses – past tenses, reading comprehension
Week 5	Tenses- future tenses, writing basics and strategies.
Week 6	Passive and active sentence in scientific writing.
Week 7	Listening skills - how to participate in different topics - how to avoid silence, how to answer the questions of the passage in exam (i.e., WH Questions)
Week 8	Writing skills (punctuation - ways to join sentences - principles of paragraph structure - practice writing)
Week 9	Listening and speaking skills (multiple native conversations, especially in the technical language of chemical engineering).
Week 10	Idioms and idiomatic expression
Week 11	Reading skills (skimming, scanning, and intensive reading)
Week 12	Phrasal verbs, speaking skills (participating in a dialogue and turn taking)
Week 13	Translation (from English to Arabic and vice versa)

Week 14	Comparison and modals, participating in group discussion and be active listener/speaker
Week 15	Writing skills (CV, cover letter, and email writing and related technical language used by chemical engineer)

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- New Headway, English Course, (beginner, pre-intermediate level), John and Liz Soars and Mike Sayer, Oxford University Press. 2- Selected ESP materials. 3- The language of chemical engineering in English, Roy V. Hughson, Regents publishing company, Inc.- New headway plus (English Course), Liz & John Soars (2014), Oxford University press.	Yes
Recommended Texts	Grammar in Use and Rapid Review of Grammar.	No
Websites	Randall's ESL Cyber Listening Lab - English Listening	

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: Marks 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.

	Ministry of Higher Education and Scientific Research - Iraq Al-Farabi University College Petroleum and Gas Refinery Eng.	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	General Mathematics			**Module Delivery**	
Module Type	Basic			**Theory** **Lecture** **Tutorial**	
Module Code	GEMA112				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		**Semester of Delivery**	1	
Administering Department	CES.PR		**College**	CES	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name	Asst.Prof..Dr. abdulfattah Mohamed Ali		**e-mail**	abdulfatah.mohamed@alfarabiuc.edu.iq	
Review Committee Approval	01/06/2023		**Version Number**	1.0	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To develop an understanding with the concepts of calculus and analytic geometry and the applications of these concepts to the solution of engineering problems. 2. Introduction to functions, limits, derivatives and their applications. 3. Provide practice at developing critical thinking skills, solving open ended problems and to work in teams.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Develop a deep understanding of issues related to the basic principles of calculus, and how to solve problems in chemical engineering. 2. The ability to understand and analysis problems related to specific field. 3. Understanding the necessary of all subject of mathematics in other sciences . 4. Understanding the necessary of derivatives and its application in other sciences. 5. An ability to apply effective, creative and innovative solutions, both independently and cooperatively, to current and future problems. 6. Characterization and analyses the performance of any problems in any object of chemical engineering.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Preliminaries Real numbers, Interval, Absolute value, Cartesian coordinates in the plane, Domain and range, Even & odd functions, Sum, differences, products & quotients, Composite functions, shifting a graph of a function, Scaling & reflecting a graph of a function. [6 hrs] Limits and Continuity Limits, Finite limits, Horizontal asymptotes, Vertical asymptotes, Continuity. [6 hrs] Transcendental functions Natural logarithms functions, Exponential functions, Logarithms functions, a^x functions, Trigonometric functions , Inverse trigonometric functions , Hyperbolic functions, Inverse hyperbolic functions. [9 hrs] Tangents & Derivatives Finding a tangent to the graph of a function, Differentiation, Differentiation rules, Second & higher-order derivatives , The derivative as a rate of change , Derivatives of trigonometric functions , The chain rule & parametric equations , The chain rule with powers of a function , Slopes of parameterized curves , Implicit differentiation , Related rates , L' Hopital's rule. [15 hrs] Determinates Properties of determinates, Cramer 's rule [3 hrs] Vector analysis Component form, Vector algebra operations, Unit vectors, Midpoint of a line segment , Vector tangent & normal to the curve , The dot product , Angle

	between vectors , Perpendicular (orthogonal) vectors , Dot product properties & vector projections , The cross product [6 hrs]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive and tutorials.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	102	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	4,8,12	LO #2, 3, 4 and 5
	Discussion	1	5% (5)	Continuous	
	Report	1	5% (5)	14	LO # 1 and 6
Summative assessment	**Midterm Exam**	2hr	10% (10)	10	LO # 2, 3, 4 and 5
	Final Exam	2hr	70% (70)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Real numbers, Interval, Absolute value, Cartesian coordinates in the plane, Domain and range
Week 2	Even & odd functions, Sum, differences, products & quotients, Composite functions , Shifting a graph of a function , Scaling & reflecting a graph of a function
Week 3	Limits, Finite limits
Week 4	Horizontal asymptotes, Vertical asymptotes , Continuity
Week 5	Natural logarithms functions, Exponential functions, Logarithms functions , a^x functions

Week 6	Trigonometric functions, Inverse trigonometric functions
Week 7	Hyperbolic functions, Inverse hyperbolic functions
Week 8	Finding a tangent to the graph of a function
Week 9	Differentiation , Differentiation rules , Second & higher-order derivatives
Week 10	The derivative as a rate of change , Derivatives of trigonometric functions
Week 11	The chain rule & parametric equations , The chain rule with powers of a function , Slopes of parameterized curves
Week 12	Implicit differentiation , Related rates , L'Hopital's rule
Week 13	Properties of determinates , Cramer 's rule
Week 14	Component form , Vector algebra operations , Unit vectors , Midpoint of a line segment , Vector tangent & normal to the curve
Week 15	The dot product , Angle between vectors , Perpendicular (orthogonal) vectors , Dot product properties & vector projections , The cross product
Week 16	Final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Thomas' Calculus Early Transcendentals", George B.Thomas, Jr. , Twelfth Edition, Addison-Wesley, 2010	Yes
Recommended Texts	"Mathematical Methods in Chemical Engineering", Jenson. V.J. and Jeffereys, G.V, 2nd Edition, Academic Press New York, 1977	Yes
Websites		

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB 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.

Ministry of Higher Education and Scientific Research - Iraq
Al-Farabi University College
Petroleum and Gas Refinery Eng.

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Analytical Chemistry			**Module Delivery**	
Module Type	Basic			**Theory** **Lecture** **Tutorial** **Lab**	
Module Code	ANCH113				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		**Semester of Delivery**	1	
Administering Department	CES.PR		**College**	CES	
Module Leader	Dr. Kafaa Fadhil abbas		**e-mail**	kafaa.alani@alfarabiuc.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	PH.D.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name	Asst.Prof..Dr. abdulfattah Mohamed Ali		**e-mail**	abdulfatah.mohamed@alfarabiuc.edu.iq	
Review Committee Approval	01/06/2023		**Version Number**	1.0	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	1-Preparing applied engineers in the field of sciences who are distinguished by ahigh level of knowledge and technological creativity, and develop problem solving skills by knowing important Laws of Chemistry. 2. Enable the student to know and understand calculation and methods of preparing solutions needed in many field.3. Enable the student to understand theoretical principles in handicrafts and measurements.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- To recognize how to calculate molecular weight by different methods. 2- The principle of preparing standard solutions which is very important every time and place to chemical engineering student in every stage. 3- Studying instrumental analysis method to know how devices works (mechanism and calculation. 4- The student acquires basic engineering skills such as Electrical and spectral in addition to traditional methods of analytical chemistry installations that serve him in the professional field. 5- Enabling the student to use labs tools and devices in chemistry laboratory.		
Indicative Contents المحتويات الإرشادية	1. Introducing the student to the basics of calculation of Analytical Laws, and methods of measurement and standardization 2. Introducing the student to use different types of laboratory tools 3. Introducing students to deal with Chemicals 4. Introducing the student to the basics of keeping safe in the lab 5. Introducing the student to the basics of the art of solving exercises 6. Introducing the student to accept the experience in theoretical and practical subject through Four years of study .		
Learning and Teaching Strategies استراتيجيات التعلم والتعليم			
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving		

	some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10	3,7,11,13	1,2,3,4
	Report	3	10	4.9,15	1,2,3,4
	Lab	15	10	12	4
Summative assessment	**Midterm Exam**	2hr	10% (10)	10	LO ALL
	Final Exam	2hr	60% (70)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction of Atom -theories of discovering atom. Experiments of Scientist. -Defects of some theories and solutions.
Week 2	Introduction of Analytical Chemistry -branches of analytical chemistry (Definition and classification) -methods of calculation for every branch of analytical chemistry.
Week 3	Molecular weight calculation for atom and molecules. -oxidation states for ions and valence numbers for acids and bases. -Mole fraction, weight fraction. volume fraction. -solving examples and giving homework.
Week 4	Molarity, Normality, Law and Calculation, Examples and HomeWorks
Week 5	Strong and weak acid and base (scientist definitions). -PH for strong acid and base. -PH for weak acid and base. -Written exam in practical exercises. (quiz)
Week 6	Blacksmith Workshop -An exercise forming the number five in English. - Exercise forming the number nine in

	English. -An exercise in forming an iron model in the form of a circle.
Week 7	Blacksmith Workshop S-shape exercise. Air hammer hot barbell exercise. Exercise to form a circle on an electric bending machine. Exercising cold and hot ornament formation. A written exam in practical exercises
Week 8	-PH for weak acid and its salt. PH for weak base and its salt. -solving exercise. Calculation of PH for common ion. -Solving exercise and homework.
Week 9	Chemical Equilibrium -calculation the rate of chemical equilibrium reaction -factors affecting on Chemical Equilibrium. -solving examples and homework
Week 10	Spectroscopic Analysis. -Introduction about Spectroscopy. -Methods of spectroscopic Analysis: -Ultra Violet (UV), Infra-Red (IR) Spectroscopy. -Wave length, preparing the sample
Week 11	Atomic Absorption Spectroscopy (AAS) -PH Meter. -Chromatography -Wave length, preparing the sample .
Week 12	Environmental Chemistry ----- Water Chemistry -Fresh water. Hydrological cycle. Waste water. -Water pollutant: chemical water pollutant. -Characterization of waste water
Week 13	Air Pollution - Air pollutant: primary pollutant, secondary pollutant Photo chemical smog. -Formation and Depletion of Ozone in the Stratosphere.
Week 14	Soil Pollution -Domestic and Municipal wastes. -Industrial and Mining wastes. -Agricultural wastes. -Radioactive Materials. -Biological Agents.
Week 15	Third Exam.
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Tools and safety instruction in laboratory
Week 2	Lab 2: preparation of standard solutions
Week 3	Lab 3: Direct titration
Week 4	Lab 4: Oxidation -Reduction Titration
Week 5	Lab 5: Calculation of chloride ion in tap water
Week 6	Lab 6: Acidity of Vinegar
Week 7	Lab 7: Hardness of Water

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
	الكيمياء التحليلية د. نجاة جمعة	Yes
Recommended Texts	Analytical Chemistry....Skoog and West Holler	Yes
Websites		

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB 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.

	Ministry of Higher Education and Scientific Research - Iraq Al-Farabi University College Petroleum and Gas Refinery Eng.	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	PHYSIS & STRENGTH OF Materials			**Module Delivery**	
Module Type	Basic			**Theory** **Lecture** **Tutorial** **Seminar**	
Module Code	PHST114				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		**Semester of Delivery**	1	
Administering Department	CES.PR		**College**	CES	
Module Leader	Prof. walid Mohamed saleh		**e-mail**	walid.mohamed@alfarabiuc.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name	Asst.Prof..Dr. abdulfattah Mohamed Ali		**e-mail**	abdulfatah.mohamed@alfarabiuc.edu.iq	
Review Committee Approval	08/ 06/2023		**Version Number**	1.0	

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Secondary School	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Determine the components of linear motion (displacement, velocity, and acceleration). 2. Solve problems involving forces and work. 3. Apply Newton's laws to physical problems. 4. Identify the different types of energy. 5. Solve problems using principles of conservation of energy. 6. Define the principles of momentum and collisions. 7. This class is designed to study the effects of external forces on a group of solid objects. 8. This class is designed to study the resistance of materials and their applications in chemical engineering
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Students will demonstrate basic understanding of basics and definitions of physics. 2. The student should be able to describe the motions of objects using generalized coordinates, power, forces and energy. 3. To familiarize the students with basic concepts of the thermodynamics and their applications in engineering problems 4. The student should be able to apply the Newtonian laws using various mathematical formulations 5. The student should be able to identify the mathematical quantities which effect the momentum and be able to calculate momentum from mass and velocity. 6. A student should be able to appreciate that physics is relevant to the real world and is a useful tool for solving problems 7. The student should be able to identify the resistance of materials and their applications in chemical engineering
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Motion in one Dimension: • Position• Displacement• Velocity• Acceleration• Derivation: creating new equations• Motion equations for constant acceleration• Free-fall acceleration (3hr) Work, Energy, and Power: • Energy• Kinetic energy• Work-kinetic energy theorem• Power• potential energy• Work and gravitational potential energy• Conservation of energy (3hr) Thermodynamics and Thermal Stress: • Temperature and Heat• Temperature and thermometers• Temperature scales• Temperature scale conversions• Heat• Zeroth law of thermodynamics• Internal energy • Thermal expansion and its types• Specific capacity• Phase changes• Latent heat• Modes of heat transfer• Global warming and the greenhouse effect (5hr) Force and Newton's Laws:

	Surface Tension, Viscosity. Newton's first law• Gravitational force: weight• Newton's second law• Newton's third law• Normal force• Tension• Newton's second and third laws (5hr) Momentum: • Linear momentum• Conservation of momentum• Collisions Force Vectors and Force System Resultants (4hr) Properties of matter Equilibrium of Rigid Bodies :Moment of a Force: Introduction Force in Rigid Bodies: Poisson Ratio, Composite Stresses: (30hr) Modern Physics (5hr) Chemical Effect of Electricity: (4hr)

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple problems and design involving activities that are interesting to the students.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	3,8	1, 3,6
	Assignments	2	5% (10)	5	1,3,
	Seminar	1	5% (10)	13	1-7
Summative assessment	**Midterm Exam**	1 hr/2	10% (10)	4,10	1-5
	Final Exam	3hr/1	70% (50)	16	1-7
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Motion in one Dimension: • Position• Displacement• Velocity• Acceleration• Derivation: creating new equations• Motion equations for constant acceleration• Free-fall acceleration
Week 2	Work, Energy, and Power: • Energy• Kinetic energy• Work-kinetic energy theorem• Power• potential energy• Work and gravitational potential energy• Conservation of energy
Week 3	Thermodynamics and Thermal Stress: • Temperature and Heat• Temperature and thermometers• Temperature scales• Temperature scale conversions• Heat• Zeroth law of thermodynamics• Internal energy • Thermal expansion and its types• Specific capacity• Phase changes• Latent heat• Modes of heat transfer• Global warming and the greenhouse effect
Week 4	Force and Newton's Laws: Surface Tension, Viscosity. Newton's first law• Gravitational force: weight• Newton's second law• Newton's third law• Normal force• Tension• Newton's second and third laws
Week 5	Momentum: • Linear momentum• Conservation of momentum• Collisions Force Vectors and Force System Resultants
Week 6	Equilibrium of Rigid Bodies
Week 7	Moment of a Force: Moment about a point, Resultant moment of multiple forces, Moment of Couple
Week 8	Friction and Friction on an Inclined Plane
Week 9	Internal Forces and Centroid & Center of Gravity
Week 10	Introduction Force in Rigid Bodies: Definitions of Stress and Strain, Stress-Strain Diagrams Elastic limit, Stiffness elasticity, Plasticity, Hardness and working stress.
Week 11	Hooke's law and spring force• Air resistance • Free body diagram• Static and kinetic friction
Week 12	Poisson Ratio, Composite Stresses: Volumetric Stress, Bulk Modulus, Thin-Walled Cylinders Shear and Bending Moments in Beam
Week	Modern Physics: Electron, thermionic, emission, photoelectric emission,• X-ray• The nucleus• Structure of nucleus and atom• Radioactivity• Nuclear energy• Ionizing radiation• Health

13	hazards
Week 14	Introduction to IS units and DC circuit:Materialuseinelectriccomponent,ohmslaw,temperatureCoefficient,Review of Kirchhoff's Laws, Series and Parallel circuit, Resistance and resistivity Electrolysis, Electroplating, Electrical Cells
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1 Shipman, James, Jerry D. Wilson, Charles A. Higgins, and Bo Lou. An introduction to physical science. Cengage Learning, 2013. **2.** Principle of Physics, Kinetic Books Company, 2007	yes
Recommended Texts	Principles of physics Kinetic book (1-877-4kbooks) Engineering Physics I&II Engineering mechanics by Ferdinand Engineering mechanics by R.C. Hibbeler	no

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB 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.

	Ministry of Higher Education and Scientific Research - Iraq Al-Farabi University College Petroleum and Gas Refinery Eng.	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Computer Science	**Module Delivery**	
Module Type	Basic	**Theory** **Lecture** **Lab**	
Module Code	COSC115		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	**Semester of Delivery**	1
Administering Department	CES.PR	**College**	CES
Module Leader		**e-mail**	
Module Leader's Acad. Title		**Module Leader's Qualification**	
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	Asst.Prof..Dr. abdulfattah Mohamed Ali	**e-mail**	abdulfatah.mohamed@alfarabiuc.edu.iq
Review Committee Approval	01/06/2023	**Version Number**	1.0

Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	

Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- Learn the basics of computer and operation system Windows 7 and application program Office 2010 and programming language (Visual Basic) and used to solve the problems of chemical engineering. 2- emphasizes the general principles and techniques of computer programming, which can be applied to almost any programming language. Although the emphasis is on programming in any language, this course focuses on one language, in particular, called Visual Basic. It provides the students with a basic understanding and appreciation of the various essential programming-languages constructs, programming paradigms, evaluation criteria and language implementation issues. 3- develop the mathematical skills necessary to solve practical problems 4- Equip you with the knowledge and skills for a range of careers in technology and computer-based industry 5 developing critical thinking skills, solving open-ended problems and working in teams.-
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Be able to operate computer hardware and peripherals, Overview of computer systems-hardware and operating systems. Be familiar with software applications, understand file management and have skills in developing simple scientific and educational programs 2- skills in using Microsoft software; and accomplishing creating essential documents, worksheets and databases. 3- Demonstrate knowledge and understanding of the core ideas of programming languages. 4- Analyze a problem, and identify and define the computing requirements appropriate to its solution. 5- Apply algorithmic principles and computer science to design problem solutions. 6- Understand and apply various programming principles to solve problems in different areas. 7- Demonstrate knowledge and understanding of the core ideas of programming languages. 7- Analyze a problem, and identify and define the computing requirements appropriate to its solution. 8- Apply algorithmic principles, and computer science to design problem solutions. 9- Understand and apply various programming principles to solve problems in different areas.
Indicative Contents المحتويات الإرشادية	❖ Microsoft Windows 7(1 hr.) ❖ Microsoft Word (1 hr.) ❖ Microsoft Excel(1 hr.) ❖ Introduction To Visual Basic Programming • Menu bar • Tools bar • Project explorer • Tool box • Properties windows

	• Form • Code• Controls: Command Buttons, Labels, Textbox, Pointers, Picture box, frame. • Naming Controls. • Properties for controls: Height, Width, Left, Top, Font, Forecolor, Backcolor, Name, Caption, Text, and Visible.(1 hr.) ❖ Events. • Saving Visual Basic Project. • Examples: Chemical Engineering Applications.(1 hr.) ❖ Built-In Functions Built-in math functions: • Abs(x), Int(x), Rnd(x), sgn(x), sqr(x), str(x), val(x), round(x, n), CInt(x), Fix(x). • String Functions .(1 hr.) ❖ Selection Structure:Single Selection: If/Then structure.• Double Selection: If/Then/Else structure.• Nested If/Then/Else structure.• Select Case Multiple Selection Structure. • Examples: Chemical Engineering Applications. .(2 hr.) ❖ • InputBox.• MsgBox. • Examples: Chemical Engineering Applications**.** .(2 hr.) ❖ Repetition Structure:• For ... Next Loop.• While ... Wend • Do .... While ... Loop • Do ... Loop Until • Exit Do, Exit For, Examples: Chemical Engineering Applications. (2hr.) ❖ Variable • Data Types: Boolean, Integer, Long, Single, Double, String. • Valid Naming of Variables, • Initial Value for each Type of the Variables (Initial Value for each Data Type). • Size of each Variable Type in Bytes. • How to Declare Variables. (Dim statement). • Using: Dim variable-name As Data type. • Using Suffix: Integer, Long, Single, Double, String• Constant Variable. • Examples: Chemical Engineering Applications. .(1 hr.) ❖ ARRAYS:• Introduction: Defining Arrays • Array Declaration Statement • Assigning Values for Arrays (i.e. filling array's element value either by the loop or by direct assignment statement). • ReDim Statement. • Using Loops with Arrays. (i.e. writing an application on an array using loops) • Two Dimensional Arrays. • Operations on Arrays: • Fill Array Elements with Random Numbers using Rnd Function.• Sorting.• Searching. (i.e. Linear search).• Swapping Two Elements. .(1 hr.) ❖ Graphics In Visual Basic• Graphics control• Picture box• Image box • Coordinate system• Pixel• Graphics methods (Line, Circle, pset) • Examples: Chemical Engineering Applications.(1 hr.)
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering the type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	5% (5)	3-11	LO #3, 4, 5,6,7 and 8
	Assignments	5	5% (5)	2-13	LO # 1-9
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	5% (5)	13	LO # 1-9
Summative assessment	**Midterm Exam**	2 hr	15% (15)	5-14	LO # 1-9
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Windows7
Week 2	Micro soft word

Week 3	Micro soft excel
Week 4	Introduction To Visual Basic Programming
Week 5	Other toolbox items
Week 6	Mathematic functions
Week 7	Conditional sentence
Week 8	InputBox function and message box function
Week 9	Iteration loops
Week 10	Data and variable
Week 11	Array
Week 12	Menu bar
Week 13	graphics
Week 14	Review
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1:windows7,Microsoft Word, Microsoft Excel
Week 2	Lab 2: Introduction To Visual Basic Programming,writing code
Week 3	Lab 3: Mathematic functions
Week 4	Lab 4: Conditional sentence
Week 5	Lab 5: InputBox function and message box function
Week 6	Lab 6: Iteration loops
Week 7	Lab 7: Data and variable,array, the menu bar
Week 8	Lab 8:graphics

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- Microsoft® Making the Transition to Microsoft Windows 7 – Just the Basics! © 2009 CustomGuide, Inc. / Bates College (October 2011) 2- Windows® 7 Step by Step by Joan Preppernau and Joyce Cox ©2009 Joan Preppernau and Joyce Cox, Early Content—Subject to Change, Microsoft Press. 3- Step by Step, Microsoft Office Word 2007, Published by Microsoft Press A Division of Microsoft Corporation, One Microsoft Way Redmond, Washington 98052-6399, Copyright © 2007 by Joyce Cox, Joan Preppernau, and Online Training Solutions, Inc. 4- Microsoft Office Word 2007 By: Torben Lage Frandsen & Ventus Publishing Aps, The eBookboon, The eBook company,2010 5- BEGINNING EXCEL, Barbara Lave, Diane Shingledecker, Julie Romey, Noreen Brown, & Mary Schatz, Portland Community College, 2021,Libretext: https://workforce.libretexts.org/@go/page/14525 6- Introduction: Visual Basic Basic 6.0, By: Gary Haggard, Wade Hutchison, Christy Shibata,1st edition, 2013, bookboon.com 7- Programming Microsoft Visual Basic 6.0, PUBLISHED BY:Microsoft Press, A Division of Microsoft Corporation,One Microsoft Way Redmond, Washington 98052-6399, 1999 by Francesco Balena	no
Recommended Texts		No
Websites		

APPENDIX:

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	مقبول بقرار	(45-49)	More work is required but credit awarded
	F – Fail	راسب	(0-44)	A considerable amount of work required
Note:				

NB 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.

	Ministry of Higher Education and Scientific Research - Iraq Al-Farabi University College Petroleum and Gas Refinery Eng.	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Differentiation and Integration			**Module Delivery**	
Module Type	Basic			**Theory** **Lecture** **Tutorial**	
Module Code	DIIN121				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		**Semester of Delivery**	2	
Administering Department	CES.PR		**College**	CES	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name	Asst.Prof..Dr. abdulfattah Mohamed Ali		**e-mail**	abdulfatah.mohamed@alfarabiuc.edu.iq	
Review Committee Approval	01/06/2023		**Version Number**	1.0	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	GEMA112	**Semester**	1

Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To develop an understanding with the concepts of calculus and analytic geometry and the applications of these concepts to the solution of engineering problems. 2. Introduction to functions, limits, derivatives and their applications. 3. Provide practice at developing critical thinking skills, solving open ended problems and to work in teams.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Develop a deep understanding of issues related to the basic principles of calculus, and how to solve problems in chemical engineering. 2. The ability to understand and analysis problems related to specific field. 3. Understanding the necessary of all subject of mathematics in other sciences . 4. Understanding the necessary of integration and its application in other sciences . 5. An ability to apply effective, creative and innovative solutions, both independently and cooperatively, to current and future problems. 6. Characterization and analyses the performance of any problems in any object of chemical engineering.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Integration** Indefinite integrals , Rules for indefinite integrals , Integration by substitution , Definite integrals , Rules for definite integrals , Mean (average) value , One-to-one functions , Inverse functions , Derivatives of inverse of differentiable functions ,The derivative & integral of natural logarithms functions, Exponential functions, Logarithms functions, a^x functions, Trigonometric functions, Inverse trigonometric functions, Hyperbolic functions, & Inverse hyperbolic functions. [12 hrs] Techniques of integration Integration by parts , Integration of rational functions by partial fractions , Trigonometric integrals , Trigonometric substitutions , Integration of rational functions of sine & cosine. [9 hrs] Applications of definite integrals Area between the graph & the x-axis , Area between curves , Volume by slicing & rotation about an axis , The disk method , The washer method , The shell method , Length of plane curves , Length of a parametric curves , Length of curve y=f(x) , Length of curve x=g(y) , Area of surfaces of revolution , Surface area for revolution about the x-axis , Surface area for revolution about the y-axis , Surface area of revolution for parameterized curves. [12 hrs]

Partial derivatives

Partial derivatives with respect to x , Partial derivatives with respect to y , Functions of more than two variables , Second order partial derivatives , The mixed derivative theorem , partial derivatives of still higher order , The chain rule , Implicit differentiation. [6 hrs]

Polar coordinates

Definition , Polar equation & graphs , Relating polar & Cartesian coordinates , Polar equation , Graphing in polar coordinates. [6 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive and tutorials.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	102	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	4,8,12	LO #2, 3, 4 and 5
	Discussion	1	5% (5)	Continuous	
	Report	1	5% (5)	14	LO # 1 and 6
Summative assessment	**Midterm Exam**	2hr	10% (10)	10	LO # 2, 3, 4 and 5
	Final Exam	2hr	70% (70)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Indefinite integrals , Rules for indefinite integrals , Integration by substitution
Week 2	Definite integrals , Rules for definite integrals , Mean (average) value , One-to-one functions , Inverse functions , Derivatives of inverse of differentiable functions

Week 3	The derivative & integral of natural logarithms functions, exponential functions, logarithms functions, & a^x functions
Week 4	The derivative & integral of trigonometric functions, inverse trigonometric functions , hyperbolic functions, & inverse hyperbolic functions
Week 5	Integration by parts
Week 6	Integration of rational functions by partial fractions
Week 7	Trigonometric integrals , trigonometric substitutions , integration of rational functions of sine & cosine
Week 8	Area between the graph & the x-axis , area between curves
Week 9	Volume by slicing & rotation about an axis , the disk method , the washer method , the shell method
Week 10	Length of plane curves , length of a parametric curves , length of curve y=f(x) , length of curve x=g(y)
Week 11	Area of surfaces of revolution , surface area for revolution about the x-axis , surface area for revolution about the y-axis , surface area of revolution for parameterized curves
Week 12	Partial derivatives with respect to x , partial derivatives with respect to y , functions of more than two variables , second order partial derivatives
Week 13	The mixed derivative theorem , partial derivatives of still higher order , the chain rule , implicit differentiation
Week 14	Definition , polar equation & graphs , relating polar & cartesian coordinates , polar equation
Week 15	Graphing in polar coordinates
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	"Thomas' Calculus Early Transcendentals", George B.Thomas, Jr. , Twelfth Edition, Addison-Wesley, 2010	Yes
Recommended Texts	"Mathematical Methods in Chemical Engineering", Jenson. V.J. and Jeffereys, G.V, 2nd Edition, Academic Press New York, 1977	Yes
Websites		

APPENDIX:

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB 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.

	Ministry of Higher Education and Scientific Research - Iraq Al-Farabi University College Petroleum and Gas Refinery Eng.	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Chemical Engineering Principles I		**Module Delivery**	
Module Type	Core		**Theory** **Lecture** **Tutorial** **Seminar**	
Module Code	CHES.P.131			
ECTS Credits	6			
SWL (hr/sem)	36			
Module Level	1	**Semester of Delivery**	2	
Administering Department	CES.PR	**College**	CES	
Module Leader	Dr. Khalid Abd Ali	**e-mail**	dr.khalid@alfarabiuc.edu.iq	
Module Leader's Acad. Title	Lecture	**Module Leader's Qualification**	Ph.D.	
Module Tutor	None	**e-mail**	None	
Peer Reviewer Name	Asst.prof.Dr. abdulfattah Mohamed Ali	**e-mail**	abdulfatah.mohamed@alfarabiuc.edu.iq	
Review Committee Approval	01/06/2023	**Version Number**	1.0	

Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	ANCH113	**Semester**	1

Co-requisites module	DIIN121	Semester	2

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To understand how Dimensions, Units, Their Conversion and Dimensional Consistency (Homogeneity) 2. To understand how dealing with of Multicomponent Solutions and Mixtures 3. This course deals with the basic concept of material balance. 4. To understand how to solve material balance problems
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Have a deep knowledge, wide scope and improved understanding of the mechanisms in mass balance as well as a better insight into analytical and empirical methods applied in analysis of material balance related problems. 2. Gain knowledge for applying the material balance in chemical engineering problems. 3. To provide experience for students to solve material balance for different process 4. To enhanced the student's ability to develop a strategy for the analyzing and resolving material balance problems 5. To be able to understand the principles and essentials of energy balancing and the relationship between the energy consumed and the generated energy
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A -Dimensions, Units, And Their Conversion Dimensions Are Our Basic Concepts Of Measurement Such As Length, Time, Mass, Temperature, And So On; Units Are The Means Of Expressing The Dimensions, Such As Feet Or Centimeters For Length, And Hours Or Seconds Or Time., Operations With Units, Conversion Of Units And Conversion Factors [10 hrs] Introduction to Moles, Density and Concentration, Mole Fraction and Mass (Weight) fraction: Theprocedureforconvertingonesetofunitstoanotherissimplytomultiplyanynumberandits associated units by ratios termed conversion factors to arrive at the desired answer and its associated units. Analyses of Multicomponent Solutions and Mixtures: The composition of gases will always be assumed to be given in mole percent or fraction unless specifically stated otherwise.

	The composition of liquids and solids will be given by mass (weight) percent or fraction unless otherwise specifically stated.[8 hrs] Choosing a Basis: A basis is a reference chosen by you for the calculations you plan to make in any particular problem, and a proper choice of basis frequently makes the problem much easier to solve. The basis may be a period of time such as hours, or a given mass of material, such as 5 kg of CO2, or some other convenient quantity. [8 hrs] Temperature: Temperature is a measure of the energy (mostly kinetic) of the molecules in a system. This definition tells us about the amount of energy. Other scientists prefer to say that Temperature is a property of the state of thermal equilibrium of the system with respect to other systems because temperature tells us about the capability of a system to transfer energy (as heat). [8 hrs] Revision problem classes [4 hrs] Part B - Introduction to Material Balances Fundamentals: The Concept of a Material Balance: A material balance is nothing more than the application of the law of the conservation of mass. [8 hrs] A General Strategy for Solving Material Balance Problems: Problem Solving: An orderly method of analyzing problems and presenting their solutions represents training in logical thinking that is of considerably greater value than mere knowledge of how to solve a particular type of problem. [4 hrs] Solving Material Balance Problems for Single Units without Reaction The use of material balances in a process allows you (a) to calculate the values of the total flows and flows of species in the streams that enter and leave the plant equipment, and (b) to calculate the change of conditions inside the equipment. [10 hrs]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple problems and design involving activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2 and 3
	Assignments	2	10% (10)	2, 12	LO # 3, 4 and 5
	discussion	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 4 and 5
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-5
	Final Exam	2hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered

Week 1	Introduction - Dimensions, Units, and Their Conversion
Week 2	Dimensional Consistency (Homogeneity)
Week 3	Operations with Units
Week 4	Introduction to Moles, Density and Concentration
Week 5	Mole Fraction and Mass (Weight) Fraction
Week 6	Analyses of Multicomponent Solutions and Mixtures
Week 7	Choosing a Basis: A basis is a reference chosen by you for the calculations you plan to make in any particular
Week 8	An introduction to temperatures and temperature concepts and their effect on other thermal properties
Week 9	Mid-term Exam
Week 10	Introduction to Material Balances, the Concept of a Material Balance
Week 11	Steady-State and Unsteady-State Systems
Week 12	General Strategy for Solving Material Balance Problems
Week 13	Degree of Freedom Analysis
Week 14	Solving Material Balance Problems for Single Units without Reaction
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	D.M.Himmelblau and J.B.Riggs ,Basic Principles and Calculations in Chemical Engineering ,8th Edition , 2012 .	Yes

Recommended Texts	R.M.Felder and R.W.Rousseau ,Elementary Principles of Chemical Processes ,3rd Edition ,2005 .	Yes
Websites	https://www.icheme.org/education/whynotchemeng/	

APPENDIX:

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB 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.

	Ministry of Higher Education and Scientific Research - Iraq Al-Farabi University College Petroleum and Gas Refinery Eng.	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Chemistry of Petroleum			**Module Delivery**	
Module Type	Basic			**Theory** **Lecture** **Tutorial** **Lab**	
Module Code	CHPE123				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		1	**Semester of Delivery**		2
Administering Department		CES.PR	**College**	CES	
Module Leader	Kafaa Fadhil abbas		**e-mail**	kafaa.alani@alfarabiuc.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name		Asst.prof..Dr. Abdulfattah Mohamed Ali	**e-mail**	abdulfatah.mohamed@alfarabiuc.edu.iq	
Review Committee Approval		01/06/2023	**Version Number**		1.0

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ANCH112	**Semester**	1

Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1-Preparing applied engineers in the field of sciences who are distinguished by a high level of knowledge and technological creativity, and develop problem solving skills by knowing important organ compound. 2. Enable the student to learn the basic concept of organic chemistry.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- To recognize the most important organic compound that found in petrochemical products. 2- The principle of preparing important organocompound that chemical engineering student needs to know. 3- Knowing the most important method to identify and distinguish between organic compounds. 4- Students will learn the chemistry of petroleum and refinery.
Indicative Contents المحتويات الإرشادية	1. Introducing the student to the basics of naming organic compounds. 2. Introducing the student to use different types of laboratory tools 3. Introducing students to deal with Chemicals 4. Introducing the student to the basics of keeping safe in the lab 5. Introducing the student to the basics of the art of preparing some of organic materials 6. Introducing the student to accept the experience in theoretical and practical subject through Four years of study.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10	3,7,11,13	1,2,3,4
	Report	3	10	4.9,15	1,2,3,4
	Lab	15	10	12	4
Summative assessment	**Midterm Exam**	2hr	10% (10)	10	LO ALL
	Final Exam	2hr	60% (70)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction of organic compound -Naming and physical properties of Alkanes. Representation of structure. -Cycloalkanes.
Week 2	-Preparing of Alkanes -Substitution Reactions -Reactions of Alkanes.
Week 3	-Alkenes: -Naming, physical properties. -Representation of alkenes structure.
Week 4	-Preparing of Alkenes. -Elimination Reactions. -Reactions of Alkenes. Alkynes, Naming and physical properties
Week 5	-Preparation of Alkynes. - Elimination Reaction of Alkynes,
Week 6	--Alkyl Halide: -Naming and physical properties. -Primary, Secondary, tertiary Alkyl Halide. - Preparation of Alkyl Halides
Week 7	Blacksmith Workshop -An exercise forming the number five in English. - Exercise forming the number nine in English. -An exercise in forming an iron model in the form of a circle .

Week 8	Blacksmith Workshop - S-shape exercise. - Air hammer hot barbell exercise. - Exercise to form a circle on an electric bending machine. - Exercising cold and hot ornament formation. A written exam in practical exercises.
Week 9	-Reaction of Alkyl Halide -Examples. -Homework
Week 10	Alcohols. -Naming and physical properties. -Primary, secondary and tertiary Alcohols. -Preparation of Alcohols.
Week 11	-Reactions of Alcohols. -Example -Homework
Week 12	-Aldehyde and Ketones: -Naming and physical properties. -Preparing of Aldehyde. -Preparing of Ketones. -Distinguish between Aldehyde and Ketones
Week 13	Mechanism of Organic Reactions: - Elimination Reactions. Substitution Reactions.
Week 14	Heterocyclic Compounds -Preparing and reaction of: -Furan. -Pyrrole. -Pyridine.
Week 15	Third Exam.
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Melting Point
Week 2	Lab 2: preparation of Aspirin
Week 3	Lab 3: Simple Distillation
Week 4	Lab 4: Esterification
Week 5	Lab 5: Saponification Reaction
Week 6	Lab 6: Identification of functional group I
Week 7	Lab 7: Identification of functional group II

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Ghatak, k (textbook of organic chemistry PHL learning 2014	متوفر
Recommended Texts	Morrison; Boyd (Organic chemistry) 6^{m}ed	
Websites	Bruice,p,yj,m(Organic chemistry) 7th ed. 2014	

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB 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.

	Ministry of Higher Education and Scientific Research - Iraq Al-Farabi University College Petroleum and Gas Refinery Eng.	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Engineering Drawing and AutoCAD			**Module Delivery**	
Module Type	Basic			**Theory** **Lecture** **Lab**	
Module Code	EDAU124				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		**Semester of Delivery**	2	
Administering Department	CES.PR		**College**	CES	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name	Asst.Prof..Dr. abdulfattah Mohamed Ali		**e-mail**	abdulfatah.mohamed@alfarabiuc.edu.iq	
Review Committee Approval	01/06/2023		**Version Number**	1.0	

Relation with Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	Engineering Drawing 4. The aims of the course provide a deep knowledge, wide scope and improved understanding of the engineering drawing. 5. The students should gain knowledge to apply the engineering drawing in engineering applied. Auto CAD 6. Understand the fundamental concepts and features of Auto CAD. 7. Learn sketching and taking field dimensions. 8. Take Data and transform it into graphic drawings. 9. Learn basic engineering drawing formats. 10. Learn basic Auto CAD skills. 11. Learn how draw 2D and 3D drawings in Auto CAD.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Engineering Drawing 1. The students can be use Tools Drawing in draw and analyze geometric shapes. 2. Enable students to draw devices, equipment & PFD in chemical engineering Auto CAD 3. Utilize the power and precision of Auto CAD as a drafting and design tool used in chemical engineering design. 4. Apply basic CAD concepts to develop and construct accurate 2D geometry. 5. Create, manipulate and edit 2D drawings and figure. 6. Apply elements of mechanical drafting such as layers,. dimensions, drawing format 7. Create, manipulate 3D drawings and figure.		
Indicative Contents المحتويات الإرشادية	Engineering Drawing ❖ 1 Introduction 3 hr. ❖ 2 Planning of Drawing paper 3hr. ❖ 3 Types of line 3hr. ❖ 4 Engineering operation 3hr. ❖ 5 Projections Drawing 3hr. ❖ 6 First angle projection 3hr. ❖ 7 Third angle projection 3hr. ❖ 8 Full section 3hr. ❖ 9 Half section 3hr. ❖ 10 The finding of third view 3hr. ❖ 11 Application Example 3hr. ❖ 12 Pictorial Drawing (Isometric and Oblique) 3hr. ❖ 13 Dimensions 3hr. ❖ 14 Examples of Chemical Engineering drawing and exercises.		

	Auto CAD ❖ Introduction, drawing program screen components, Setting drawing limits, Units, Grid and snap, Zoom, Orthogonal, Osnap. 2D drafting: Cartesian system coordinate, AutoCAD drawing command (6hrs). ❖ Point, Line: line, multi-line, construction line, drawing line by using: absolute coordinate, polar coordinate, relative coordinate, Examples. ❖ Continuous line drawing: Rectangle, Polygon, Poly line with their options, Examples (6 hrs). ❖ Curves drawing: Arc, Circle, point –SP line, Ellipse with their options, Example (6 hrs). Modify command: ❖ 1-copy tool: copy, mirror, offset, array. 2- Erase tool: erase, trim, break .3-move tool: move, rotate Examples (6 hrs).4- Change tool: stretch, Lengthen, Extend, Scale, Chamfer, and Fillet .5-Explode, Examples (6 hrs). ❖ Layers: Create a new layer, rename layer, active layer, run and extinguishing layers, Freezing layers, Lock and open layers, the color, Font type, Line width, Example (6 hrs). ❖ 3D drawing methods: Surfaces drawing: box, Wedge, Pyramid, Dome, Sphere, Cone, Torus, Dish, Example (6 hrs). ❖ 3D drawing methods: Solids: box, Cylinder, Sphere, Cone, Wedge, Torus, Examples (6 hrs).
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in the delivery of this module is to encourage students to participate in the exercises, while improving and expanding their critical thinking skills at the same time. This will be achieved through classes, giving engineering designs, participating in solving them, and competing in giving ideas and skills for the solution.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL(h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.8
Total SWL(h/sem)	150		

الحمل الدراسي الكلي للطالب خلال الفصل	

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	3-10	LO #1, 2, 4,5,and 7
	Assignments	5	5% (5)	2-13	LO # 1-7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	5% (5)	13	LO # 1-7
Summative assessment	**Midterm Exam**	2 hr	20% (20)	6,14	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction and Planning of Drawing paper.
Week 2	Types of line and Engineering operation.
Week 3	Projection Drawing, first angle projection and third angle projection.
Week 4	Full section, half section, the finding of third view and application Example.
Week 5	Pictorial Drawing (Isometric and Oblique) and Application Example.
Week 6	Dimensions, examples of chemical engineering drawing and exercises.

Week 7	Final Exam.
Week 8	Introducing the AutoCAD program and interfaces and Drawing settings, preparing the drawing screen and worksheet.
Week 9	Create two-dimensional graphics (line drawing methods)(rectangle, circle).
Week 10	Create two-dimensional graphics (polygon, Arc, polyline, Ellipse).
Week 11	Modification Operations (Erase, Copy, Mirror, Offset, Move, Explode,Fillet,chamfer, Trim,).
Week 12	Modification Operations (Rotate, Scale,Extend , Array, Break, Stretch)
Week 13	Drawing with layers
Week 14	3D drawing methods: Surfaces drawing
Week 15	3D drawing methods: Solids
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Drawing rectangular using lines in absolute coordinate, polar coordinate, relative coordinate
Week 2	Lab 2: Drawing line,rectangular,circle
Week 3	Lab 3: Drawing Arc, polygon, point –SP line, Ellipse
Week 4	Lab 4: Drawing simple 2D shape and applying Modify commands such as copy, mirror, offset, array , trim, move, rotate , stretch, Lengthen, Extend, Scale, Chamfer, and Fillet
Week 5	Lab 5: Drawing a simple 2D chemical engineering drawing and applied layers.
Week 6	Lab 6:3D drawing methods: Surfaces drawing

Week 7	Lab 7: 3D drawing methods: Solids

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available
Required Texts	Engineering Drawing 1. الرسم الهندسي،تاليف (عبد الرسول الخفاف) الطبعة الثانية١٩٩٣ 2. R.P Hoelscher and C.H Springer "Engineering Drawing and Geometry AutoCAD 1-Terry T. Wohler, applying AutoCAD 2002 fundamentals, Glencoe /McGraw-Hill. 2-James A. Leach, AutoCAD 2002 Companion Essentials of AutoCAD plus Solid modeling ,2003, McGraw-Hill, Boston. 3- Terry T. Wohler, applying AutoCAD a step by step approach for AutoCAD release 13, 1996, Glencoe McGraw-Hill. 4- James A. Leach, AutoCAD 14 Companion Essentials of AutoCAD plus Solid modeling ,1999, WCB / McGraw-Hill, Boston.	no
Recommended Texts	David Byrnes and Mark Middlebrook, AutoCAD® 2007 For Dummies , Wiley Publishing, Inc.	No

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB 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.

	Ministry of Higher Education and Scientific Research - Iraq Al-Farabi University College Petroleum and Gas Refinery Eng.	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Human Rights and democracy			**Module Delivery**	
Module Type	Suplement			**Theory** **Lecture** **Seminar**	
Module Code	HURD125				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	1		**Semester of Delivery**	2	
Administering Department	CES.PR		**College**	CES	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**	.	
Module Tutor			**e-mail**	None	
Peer Reviewer Name	Asst.Prof..Dr. abdulfattah Mohamed Ali		**e-mail**	abdulfatah.mohamed@alfarabiuc.edu.iq	
Review Committee Approval	15/06/2023		**Version Number**	1.0	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1-Define the concept of human rights democracy and their characteristics 2-To promote the culture of human rights and democracy in society
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1.تزويد الطلبة بالمعرفه العامه عن حقوق الانسان والانضمه السياسية 2.تطوير قدرات الطالب المعرفية وتنمية اهتمامه في مجالات حقوق الامسان. 3.تسليح الطلبه بالمعلومات العامه عن الانضمة السياسيه ووسائل استقرارها ونجاحها 4.تسليح الطلبة بالافكار السوية التي تحميهم من الافكار المتطرفه وابعادهم غن الترويج لفكر معين. 5.خلق جيل ذات سلوك سوي يتوافق مع السلوك الجامعي 6-نقل المسؤولية للطالب في قيادة المحاظرة مع التصحيح وتشخيص المعوقات .
Indicative Contents المحتويات الإرشادية	1.معرفه مفهوم حقوق الانسان واهم خصائصه 2.معرفه فئات حقوق الانسان والاعلان العالمي لحقوق الانسان 3-.معرفه حقوق الانسان في الاسلام ثم العلاقة بين حقوق الانسان والعولمه من خلال دراسة الاصالة والمعاصرة 4.ارهاصات حقوق الانسان والفرق بين الثقافه السياسيه والايدلوجيه 5 .معرفه ماهو النظام الديمقراطية وماهي اهم سماته والتطور التاريخي للنظام الديمقراطي 6.الديمقراطيه المباشره وشبه المباشره والتمثيليه 7.العالمية والخصوصيه للنضام الديمقراطي 8.مساوء ومحاسن الديمقراطيه 9.ادلجه الديمقراطية 10.العلاقه بين الديمقراطية والتنمية 11 معرفة النظام البرلماني والنظام الرئاسي

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1.محاضرات نضريه مباشره 2. استخدام طريقه العصف الذهني 3 .تقارير علميه لكل طالب وباختيارهم 4.سيمنر لمناقشه البحوث التي تقدم من قبل الطلبه 5سؤال فكري ك.واجب بيتي 6 - في النية استخدام الداته شو لعرض فلم عن حقوق الانسان من اجل استخلاص العبر والمضامين الانسانية.

Student Workload (SWL) الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO # 1,4 and 5
	Assignments	2	5% (5)	2, 12	LO # 3, 4, 5 -and-6
	Report	1	5% (5)	13	LO # 5
Summative assessment	**Midterm Exam**	1	10% (5)	7	LO # 1-4
	Final Exam	1	70% (70)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Human Rights and Human Rights and Secularism
Week 2	The concept of human rightsand Characteristics of human rights
Week 3	Human Rights Classification
Week 4	Human Rights in Ancient Civilizations and Human Rights and Islam
Week 5	Human rights sources
Week 6	Universal Declaration of Human Rights Human Rights and the Constitution of the Republic of Iraq 2005
Week 7	Human rights and political partiesHuman Rights and Globalization
Week 8	Positions of the Arab intellectual currents of human rights and Human rights between universality and privacy
Week 9	The historical development of democracy and Forms of democracy
Week 10	Types of democratic systems
Week 11	Concept of Election

Week 12	Challenges to democratization
Week 13	Democracy between universality and privacy
Week 14	Democracy and development
Week 15	The pros and cons of democracy
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. عبد الكريم خليفة، القانون الدولي لحقوق الإنسان، بدون طبعة الإسكندرية: دار الجامعة الجديدة، 2013) 2. د. صلاح حسن مطرود, مبادئ و قواعد عامة في حقوق الأنسان	Yes
Recommended Texts	1. محمد علي الشجيري , حقوق الأنسان بين الأسلامي و العالمي 2. زكريا أبراهيم , مشكلة الحرية .	No
Websites	1. ماهر صلاح الجبوري , حقوق الأنسان و الديمقراطية 2. مجموعة باحثين، مشاكل تطبيق الديمقراطية في العالم العربي 3. رياض هاشم، اسس الديمقراطية وقواعدها 4. محمد عابد، الديمقراطية وحقوق الانسان	

APPENDIX:

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB 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.

	Ministry of Higher Education and Scientific Research - Iraq Al-Farabi University College Petroleum and Gas Refinery Eng.	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	Workshops		**Module Delivery**	
Module Type	Suplement		**Practical**	
Module Code	WOSH106			
ECTS Credits	8			
SWL (hr/sem)	200			
Module Level	1	**Semester of Delivery**	1&2	
Administering Department	Training and Workshops Center	**College**		
Module Leader		**e-mail**		
Module Leader's Acad. Title		**Module Leader's Qualification**		
Module Tutor	None	**e-mail**	None	

Peer Reviewer Name	Asst.Prof..Dr. abdulfattah Mohamed Ali	**e-mail**	abdulfatah.mohamed@alfarabiuc.edu.iq
Review Committee Approval	08/ 06/2023	**Version Number**	1.0

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Secondary School	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	1-Preparing applied engineers in the field of engineering sciences who are distinguished by a high level of knowledge and technological creativity, in line with the strict standards adopted globally in quality assurance and academic accreditation of the corresponding engineering programs, while adhering to the ethics of the engineering profession. 2. Enable the student to know and understand work systems, risks, and the factors surrounding them. 3. Enable the student to know and understand theoretical principles in handicrafts and measurements.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- To familiarize the student with the vocabulary of occupational safety and its importance in the field of work. 2- Acquisition of the student's manual operation skills, for example (Filings and Tinsmith workshops), and mechanical operation skills, for example (Turning). 3- Acquisition of the student's mechanical forming skills, for example (Casting and Blacksmithing). 4- The student acquires basic engineering skills such as Welding, Carpentry, and Electrical installations that serve him in the professional field. 5- Enabling the student to operate the various machines and devices in mechanical operations and formation. 6- Cooperative learning by working collectively.		
Indicative Contents المحتويات الإرشادية	1. Introducing the student to the basics of the art of turning and milling, types of cold working machines, the skill of dealing with them, choosing metals, operational tools, and methods of measurement and standardization 2. Introducing the student to the basics of the art of casting, hot forming, metal selection, method of working on casting furnaces and tools, and manufacturing casting molds 3. Familiarize students with the basics of cars and the systems they use, as well as maintenance, disassembly, and assembly processes.		

	4. Introducing students to the basics of household and industrial electrical appliances, the skill of using tools, and designing electrical circuits and control panels 5. Introducing the student to the basics of the art of plumbing, leveling surfaces, the skill of using tools, manufacturing and installing geometric shapes, and methods of measurement and standardization 6. Introducing the student to the basics of the art of blacksmithing, cold and hot forming of metals, the method of hardening them, and the skills of dealing with hand tools, forming machines, and heating furnaces 7. Introducing the student to the basics of the art of filing and manual operation of metals with the help of manual, electrical, and mechanical tools, the skills of dealing with them, and the methods of measurement and standardization 8. Introducing the student to the basics of the art of welding, the installation and assembly of metals, the types of welding machines, the skills of dealing with them, the types of welding, and the methods of measurement and standardization 9. Introducing the student to the basics of the art of carpentry and woodworking with the help of manual, electrical, and mechanical tools, the skills of dealing with them, and methods of measurement and standardization
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	7	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	0.46
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		
Structured SWL (h/year) الحمل الدراسي المنتظم للطالب خلال الفصل	186	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/year) الحمل الدراسي غير المنتظم للطالب خلال الفصل	14	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	0.46
Total SWL (h/year) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**				
	Assignments				All
	Projects / Practice	Every 3 weeks	60%	Continuous	
Summative assessment	**Midterm Exam**				
	Final Exam	Every 3 weeks	40%	Continuous	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Welding workshop. -Occupational safety and its importance in welding workshops. -Introduction to the basics of welding. -Electric arc exercise. -An exercise for welding straight lines in a circular motion (helical).
Week 2	Welding workshop - An exercise for welding straight lines with a crescent movement and other welding methods -Construction welding exercise.
Week 3	Welding workshop. -Welding two pieces together. -Written exam in practical exercises.
Week 4	Casting workshop -Occupational safety and its importance in plumbing workshops. -Introduction to the basics of metal casting. -Simple wooden disc exercise. Half workout.
Week 5	Casting workshop Wheel exercise. Pushing arm exercise.
Week 6	Casting workshop. -Complete pulley exercise. -Circular pole exercise. -Written exam in practical exercises.
Week 7	Blacksmith Workshop -Occupational safety and its importance in blacksmithing workshops. -Introduction to the Basics of Blacksmithing. - Barbell adjustment exercise. -Eight-star exercise. - Exercise forming the number eight in English. -Six formation exercises in English.

Week 8	Blacksmith Workshop -An exercise forming the number five in English. - Exercise forming the number nine in English. . -An exercise in forming an iron model in the form of a circle
Week 9	Blacksmith Workshop - S-shape exercise. - Air hammer hot barbell exercise. - Exercise to form a circle on an electric bending machine. - Exercising cold and hot ornament formation. .- A written exam in practical exercises
Week 10	Automotive Workshop -Occupational safety and its importance in car maintenance workshops. -An introduction to cars and their basic parts. -Parts of the engine, how it works, types of engines, and methods of classification.
Week 11	Automotive Workshop - Open the engine and identify the parts -Lubrication system -Cooling system.
Week 12	Automotive Workshop -The fuel system. -The old and new ignition circuits. -Written exam in practical exercises.
Week 13	Turning Workshop -Introduction to lathe machines and identifying their parts -Measuring tools and the use of an oven measuring instrument -Circular column lathing exercise on different diameters.
Week 14	Turning Workshop -Exercise using the pen (semicircular R) brackets. An exercise in making different angles using a pen (square + angle pen 55).
Week 15	Turning Workshop - Making shaft with different diameter exercises using (left and right pen) - Workout (Tube Connection). -Written exam in practical exercises.
Week 16	Fitting workshop Occupational safety and its importance in filing workshops -An introduction to the basics of filing -Pen holder exercise “preparation and preparation”
Week 17	Fitting workshop Pencil holder exercises finishing and assembling.
Week 18	Fitting workshop -The catcher exercise. - Clamping exercise. Written exam in practical exercises.
Week 19	Carpentry workshop -Occupational safety and its importance in carpentry workshops. - An introduction to carpentry, its types, types of wood, tools used, and preparation Preparing the tools used Face modification exercise using the reindeer

Week 20	Carpentry workshop Garden fence work and how to connect its parts, the eight-star exercise
Week 21	Carpentry workshop - Wood smoothing exercise using smoothing paper - Wood dyeing exercise in three stages Final smoothing and varnishing exercise Written exam in practical exercises
Week 22	The tinsmith workshop Occupational safety and its importance in plumbing workshops An introduction to plumbing, its tools, and plumbing stages Planning and marking exercise on metal plates
Week 23	The tinsmith workshop Geometric shapes Types of individuals and methods of individuals Geometric shape individuals exercise on a metal board
Week 24	The tinsmith workshop Cone members exercise - Exercise of cylinders with an oblique cut Roll forming operations Connection without the use of an intermediary Written exam in practical exercises
Week 25	Electric Workshop Occupational Safety and its importance in electrical workshops An introduction to the basics of electrical installations - Linking a simple circuit consisting of a lamp to the control of a single-way switch. Connect two lamps in series with one-way switch control. Connecting two lamps in parallel with the control of a single road switch. Connect two lights with one-way dual switch control.
Week 26	electric Workshop Connect a fluorescent lamp circuit to a one-way switch control Connecting an electric supply socket circuit to the control of a separate or combined one-way switch Written exam in practical exercises
Week 27	electric Workshop Occupational Safety and its importance in blacksmithing workshops Introduction to the basics of Blacksmithing - Barbell adjustment exercise Eight-star exercise - Exercise forming the number eight in English Exercise forming the number six in English
Week 28	supplementary training curriculum Welding workshop Plumbing workshop Blacksmith's workshop
Week 29	supplementary training curriculum - Automotive workshop

	- Turning workshop Fitting workshop
Week 30	supplementary training curriculum Carpentry workshop The plumbing workshop electric Workshop

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Workshop technology and measurements, Ahmed Salem Al-Sabbagh,	yes

GRADING SCHEME مخطط الدرجات				
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