Republic of Iraq
Ministry of Higher Education & Scientific Research
Supervision and Scientific Evaluation Directorate
Quality Assurance and Academic Accreditation
Fuel & Energy Techniques Engineering Department

Academic Program Specification Form For The Academic Year 2024-2025

University: Northern Technical University
College/Institute: College of Oil and Gas Techniques Engineering\Kirkuk
Scientific Department: Department of Fuel and Energy Techniques Engineering

Dean's Name :	Deans Assistant For Scientific Affairs	Head of Department
Assist.Prof. Dr.Obid Majed Ali	Assist.Prof. Dr.Galawish Nouri Taher	Dr. Mohammed Qader Abdulrahman
Date : 10/10/2024	Date : 10/10/2024	Date : 08/10/2024
Signature:	Signature:	Signature:

The College Quality Assurance
And University Performance
Manager
Maha Adnan Dawood
Date : 10/10/2024
Signature:

1.	1. Program Vision
The College of Oil and Gas Technology Engineering seeks to prepare graduates in the field of fuel and energy technology engineering and master the transfer of technology to a society that enjoys science and knowledge to keep pace with development and progress in the world and work in the oil and gas sector and the private sector and benefit from the specialization in the practical and applied field.	

2.	2. Program Mission
Working to prepare and graduate pioneering scientific and leadership competencies in the field of Fuel and Energy Technology Engineering Department to provide high-quality educational experience to prepare engineering cadres in the field of fuel and energy to meet the needs of the labor market who possess technical skills in education and research.	

3.	**Program Objectives**

1. .Preparing qualified and trained technical engineers according to international quality standards, capable of facing challenges in the field of fuel and energy engineering.
2. .2 .2Conducting applied research and studies and encouraging innovation in the field of fuel and energy production.
3. .3 .3Building strategic partnerships to enhance cooperation between the academic and industrial sectors.
4. .4 .4Disseminating scientific knowledge in the field of sustainable energy.
5. .5 .5Providing educational and training opportunities that enhance students' practical and leadership skills.
6. .6Graduating qualified engineers committed to social and environmental responsibility.

4.	.**Program accreditation**
nothing	

5.	**Other external influences**
Several aspects where many seminars and meetings were held to discuss academic and applied content with engineers specialized in the field of fuel and energy. Discussions were also held with colleges and universities that contain similar specializations through conferences, discussion	

groups and joint work that allows communication between the teaching staff and students for the purpose of coming up with a common vision and setting plans for developing curricula.

6. Program Structure

Program Structure	**Percentage**	**ESTS**	Number of courses	Notes
Institutional Requirements		240	43	Basic course
College Requirements			Yes	
Department Requirements			Yes	
Summer Training			There is	
Other				

*Notes may include whether the course is basic or optional.

7. Program Description

Credit hours	Hours depends	Course name	Course code	Year/Level
	Theoretical			/ 2024-2025

7. Expected learning outcomes of the program

Knowledge

A-A Cognitive objectives.
-1Aims to know the analysis of chemical elements.
-2Aims to know the operation of laboratory devices and work with them.
-3Aims to know the science of organic chemicals.
-4Aims to know the science of internal combustion engines.
-5Aims to know the science of mathematics and engineering analysis.
-6Aims to know how to follow industrial safety procedures and protect the environment from pollution.

Skills

B - Program specific skill objectives:

1. It aims to learn the skill of operating a computer and organized work.
2. It aims to learn the skill of operating oil and gas refining units
3. It aims to learn the skill of designing and establishing laboratories.

4. It aims to learn the skill of monitoring production lines.
5. It aims to learn the skill of scientific research through implementing the engineering graduation project) a study material.
6. It aims to learn the skill of leadership and working within a team.

Values

C- Emotional and value objectives: 1-Preparing educational cadres that can be relied upon in state institutions within the specialization.
-2Developing solutions to problems that occur in institutions and systems specialized in the field of fuel.
-3Working to prepare the requirements of the labor market and raise economic capacity.
-4Preparing engineering cadres that can bear the responsibility of leadership and teamwork.
-5Respecting time, laws and instructions and following the instructions and directives issued by higher authorities.

Teaching and learning strategies

.1Teaching and learning strategies

-There are many teaching and learning methods used in the College of Oil and Gas Engineering Technology, and the most important of these methods are: - (theoretical and practical lectures, discussion and dialogue, field visits to relevant governmental and civil institutions, discussion groups on specific topics, theoretical and practical student research, office activities.

Evaluation methods

1. Seminars.
2. Scientific discussion, oral dialogue, theoretical and practical midterm and final exams.
3. Writing and submitting reports and taking notes on the technical expertise gained during field visits
4. Quick tests (quizzes)

5. Semester and annual exams

8. Faculty						
Faculty members						
Faculty preparation		**Special requirements/skills (if any)**		**Specialization**		Academic Rank
	angel			**Special**	**General**	
	angel			2		Assistant Professor
	angel			6		Lecturer
	angel			11		Assistant Lecturer
						Without Title

Professional Development
Mentoring new faculty
Through seminars, symposia and conference attendance
Professional Development of Faculty
Through conferences, symposia, symposia and faculty attendance Postgraduate Discussions

9. **Admission criteria:**
.1The applicant must have a preparatory school certificate in the scientific branch, or a certificate of the top students in institutes or the top students in industry, and must pass the competition through the electronic application system.

10. The most important sources of information about the program
- -Methodological books. - -Auxiliary sources (secondary books). - -The Internet, self-education websites, websites of reputable international universities, and websites of Iraqi universities.

1. .Program Development Plan
2. Courses within the college. 3. Courses within higher education and scientific research institutions via electronic communication. 4. Individual or joint scientific research (applied or theoretical) 5. Scientific seminars and symposia.

Republic of Iraq - Ministry of Higher Education and Scientific Research

Northern Technical University

Bachelor's degree in Fuel & Energy Engineering (First cycle)

Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25 hr

Program Curriculum (2023 - 2024) ????

جمهورية العراق - وزارة التعليم العالي والبحث العلمي

الجامعة التقنية الشمالية

بكالوريوس تقني في هندسة تقنيات الوقود و الطاقة (الدورة الأولى)

أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة اوربية - كل وحدة اوربية = ٢٥ ساعة

المنهاج الدراسي للعام ٢٠٢٣-٢٠٢٤

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	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)							
First	One	1	FEK 101	Analytical Chemistry	الكيمياء التحليلية	English	4		2		1	1	7	127	48	175	7.00	C	
		2	FEK 102	Organic Chemistry	الكيمياء العضوية	English	4		2		1	1	7	127	48	175	7.00	C	
		3	FEK 103	Engineering Mechanics	الميكانيك الهندسي	English	3				1		5	65	60	125	5.00	C	
		4	COGTEK 100	Mathematics Principles	مبادئ الرياضيات	English	4				1		5	80	95	175	7.00	C	
		5	NTU 100	Human Rights & Democracy	الديمقراطية و حقوق الأنسان	Arabic	2						5	35	15	50	2.00	B	
		6	NTU 101	English Language	اللغة الأنكليزية	English	2						5	35	15	50	2.00	B	
						Total	19	0	4	0	4	2	34	469	281	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	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)							
First	Two	1	FEK104	Principles of Chemical Engineering	مبادئ الهندسة الكيمياوية	English	4	1			1		5	95	180	275	11.00	C	
		2	COGTEK 101	Engineering Drawing	الرسم الهندسي	English	1		2	2			5	80	120	200	8.00	C	
		3	FEK 105	Engineering Workshops	الورش الهندسية	English			3	1			5	65	85	150	6.00	C	
		4	NTU 102	Computer	الحاسوب	English	1		1				7	37	38	75	3.00	B	
		5	NTU 103	Arabic Language	اللغة العربية	Arabic	1					1	5	35	15	50	2.00	S	
						Total	7	1	6	3	1	1	27	312	438	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	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)							
	Three	1	FEK 200	Petroleum Refining	تكرير البترول	English	4		2			1	3	108	92	200	8.00	C	
		2	COGTEK 201	Mathematics	رياضيات	English	3				2		3	78	97	175	7.00	C	
		3	FEK 201	Material and Energy Balances	موازنات المادة والطاقة	English	4	1			2	1	3	123	102	225	9.00	C	
		4	FEK 202	Computer Programming-MATLAB	برمجة الحاسوب-الماتلاب	English	1		1				3	33	17	50	2.00	C	
		5	NTU 200	Baath Party crimes in Iraq	جرائم حزب البعث في العراق	Arabic	2						3	33	17	50	2.00	B	
		6	NTU 201	English Language	اللغة الإنكليزية	English	2						3	33	17	50	2.00	B	
						Total	16	1	2	0	4	2	18	408	325	700	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	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)							
Third	Five	1	FEK301	Mass Transfer	أنتقال المادة	English	4		2		1	1	3	123	52	175	7.00	C	
		2	FEK302	Engineering Analysis	التحليلات الهندسية	English	4				1	1	3	93	57	150	6.00	C	
		3	FEK303	Environmental Pollution and Industrial Safety	التلوث البيئي و السلامة الصناعية	English	2					1	3	48	52	100	4.00	S	
		4	FEK304	Termodynamics	الديناميك الحراري	English	4		2		1		3	108	67	175	7.00	C	
		5	FEK305	Gas Technology	تكنلوجيا الغاز	English	2		2			1	3	78	72	150	6.00	C	
														0		0	0.00		
						Total	16	0	6	0	3	4	15	450	300	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	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)							
Third	Six	1	FEK306	Heat Transfer	أنتقال الحرارة	English	4		2		1		3	108	67	175	7.00	C	
		2	FEK307	Numerical Analysis	التحليلات العددية	English	2		2		1	1	3	93	32	125	5.00	C	
		3	FEK308	Internal Combustion Engine	محركات الأحتراق الداخلي	English	2		2			1	3	78	72	150	6.00	E	
		4	FEK309	Fuel Cell Technology	تكنلوجيا خلايا الوقود	English	2		2			1	3	78	72	150	6.00	E	
		5	FEK310	Energy Resources	مصادر الطاقة	English	2		2			1	3	78	72	150	6.00	C	
						Total	12	0	10	0	2	4	15	435	315	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	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)							
Fourth	Seven	1	FEK401	Plants and Equipment Design	تصميم المعامل والمعدات	English	2				2	1	3	78	122	200	8.00	C	
		2	FEK 402	Combustion and Explosion Technology	تكنلوجيا الاحتراق والانفجار	English	2		2		1	1	3	93	57	150	6.00	C	
		3	FEK 403	Control and Measuring Engineering	هندسة القياس والسيطرة	English	2		2			1	3	78	43	125	5.00	B	
		4	FEK 404	Sustainable Energy	الطاقة المستدامة	English	2				1	1	3	63	87	150	6.00	C	
		5	NTU 400	Methodology of Scientific Research	منهجية البحث العلمي	English	1			2		1	3	63	62	125	5.00	C	
						Total	9	0	4	2	4	5	15	375	371	750	30.0		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	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)							
Fourth	Eight	1	FEK406	Process of Unit Operation	عمليات الوحدات الصناعية	English	2		2		1	1	3	93	82	175	7.00	C	
		2	FEK407	Power Plants	محطات القدرة	English	2		2		1	1	3	93	57	150	6.00	C	
		3	FEK408	Modeling and Simulation	النمذجة والمحاكاة	English	1		2	1	1	1	3	93	57	150	6.00	C	
		4	FEK409	Reactors Design	تصميم المفاعلات	English	2				1	1	3	63	87	150	6.00	C	
		5	COGTEK 401	Graduation Project	مشروع التخرج	English	1			2		1		60	65	125	5.00	C	
						Total	8	0	6	3	4	5	12	402	348	750	30.0		

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

Structured SWL (hr/w) type		
	CL	Class Lecture
	Lab	Laboratory
	Pr	Practical Training
	Tut	Tutorial
	Lect	Online lecture
	Semn	Seminar

Module type		
	B	Basic learning activities
	C	Core learning activity
	S	Suport or related learning activity
	E	Elective learning activity

SWL:	Student Workload
SSWL:	Structured SWL
USSWL:	Unstructured SWL

Note: Columns O, Q and R are progrmaed, protected and should not be edited

- **Please tick the boxes corresponding to the individual learning outcomes of the programme that are being assessed.**

	Ministry of Higher Education and Scientific Research - Iraq Northern Technical University Technical Engineering College Kirkuk Department of Fuel and Energy Engineering	

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Organic Chemistry**			**Module Delivery**	
Module Type	**Core**			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☒ Seminar	
Module Code	**FEK 102**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	FEK		**College**	Type College Code	
Module Leader	Galawesh N.Taher		**e-mail**	Galawesh66@ntu.edu.iq	
Module Leader's Acad. Title	Assistant professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	Galawesh66@ntu.edu.iq	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	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. Understanding what is organic chemistry 2. This course deals with the basic concept of organic chemistry. 3. This is the basic subject for all organic base compounds. 4. Understanding different type of carbon base compounds. 5. The properties and the preparation of organic copmpounds.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Summarize what is meant by organic chemistry. 2. Discuss the various types of organic compounds. 3. Understanding the properties and the importance of these compounds. 4. Understanding the preparation of these compounds from other available or alternative compounds. 5. Discuss the chemical reaction of these compounds.
Indicative Contents المحتويات الإرشادية	1- It is very important to understand and follow the general safety concept in the lab. 2- Using gloves mask and safety goggles in the lab. 3- Cautions while using different chemical compounds during the chemical reactions.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	In this model, the main strategy that will be delivered is encouraging the students' participation in the class, developing their lab skill, and 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 محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	127	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	8.4
Unstructured SWL (h/sem)	48	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.2

الحمل الدراسي غير المنتظم للطالب خلال الفصل			
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

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, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	10	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction (what is organic chemistry)
Week 2	Hybridization of carbon
Week 3	Chemical bonding(covalent bond, ionic bond)
Week 4	ALKANES ((PARAFFINES)), IUPAC NAME OF ALKANES, COMMON NAME OF ALKANES
Week 5	PROPERTIES OF ALKANES, ISOMERS
Week 6	PREPARATION OF ALKANES
Week 7	REACTIONS OF ALKANES, COMBUSTION
Week 8	ALKENES, AUPIC NAME OF ALKENES, COMMON NAME OF ALKENE
Week 9	PROPERTIES, PREPARATION OF ALKENE
Week 10	REACTION OF ALKENE
Week 11	SUBSTITUTION REACTION
Week 12	ALKYNES, NOMENCLATURE, PROPERTIES, INDUSTRIAL SOURCE
Week 13	PREPARATION OF ALKYNES, PREPARATION OF ALKYNES.
Week 14	TAUTAMERISM, ALICYCLIC HYDROCARBONS, PREPARATION OF CYCLIC COMPOUNDS, REACTIONS

Week 15	Cycloalkane undergo chiefly addition reactions, Aromatic compounds, Reactions of Aromatic compounds
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. David Basic principles and calculation in chemical engineering.	Yes
Recommended Texts	2. Richard M. Felder. Elementary principle of chemical processes.	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	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 Northern Technical University Technical Engineering College Kirkuk Department of Fuel and Energy Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Programming (MATLAB)**			**Module Delivery**	
Module Type	Core			☒ **Theory** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**FEK202**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	2		**Semester of Delivery**	1	
Administering Department	FEK		**College**	COGTEK	
Module Leader	Layth Ali Hussein		**e-mail**	Layth.ali@ntu.edu.iq	
Module Leader's Acad. Title	Ass.Lecturer		**Module Leader's Qualification**	M.Sc.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	15/09/2024		**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. Working with the MATLAB user interface. 2. Entering commands and creating variables. 3. Analyzing vectors and matrices. 4. Visualizing vector and matrix data 5. Working with data files. 6. Automating commands with scripts 7. Writing programs with branching and loops.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate use of mathematical based software to write basic programs 2. Employ computer programs to solve numerical methods problems.# 3. Demonstrate competency of creating computer programs to solve problems of ordinary differential equations, partial differential equations and optimization.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Software Engineering</u> Structural and Functional Modelling, Software Development Life cycle. Requirements determination, feasibility analysis, final specifications, hardware and software study system (design –implementation –evaluation– modification). Role of systems analyst – attributes of a systems analyst – tools used in system analysis. Types of information: operational, tactical, strategic and statutory – why do we need information systems – management structure – requirements of information at different levels of management – functional allocation of management – requirements of information for various functions – qualities of information – small case study. <u>Part B - Algorithms and Flowcharts</u>

	Introduction, Symbols, Types of flowcharts, Exercise introduction to Visual studio. Platform, Environment, Menu Bar, Toolbars, Tool Box, Project explorer, Properties window, Form designer, Form layout. Design time and run time Fundamentals. Graphical User Interface, Command Buttons, Label, text box, check box, option, list box, Timer. Constants and Variable, Arrays, Arithmetic operators, Expressions - Events, Properties, Methods - Procedures and Functions – Menus. Part C - Control Flow Statements: Condition Statement: If-Then, Select Case. Loop statement: For-Next, Do-while, Do-Loop While, Exit Loop. Exit and stop statements. Test phase Debugging, Error Handling Mashed edit control - Chart controls - Rich text box - Slider - Tabbed Dialog - Multiple forms - common dialog control. Creating executable file by Package & Deployment Wizard. Create the applications for Fluid calculation, Trial and error calculation, Enthalpy calculation, non-linear equations, and matrix inverse

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 tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

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
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	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10%(10)		
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction, Environment of MATLAB
Week 2	Arithmetic Expressions, Mathematical functions, Logical Operators, Relational Operators.
Week 3	Vectors and Matrices: Matrix operations, transpose and inverse of Matrix
Week 4	Working with polynomials (manipulating polynomials, derivatives roots, eigen values).
Week 5	Working with polynomials (manipulating polynomials, derivatives roots, eigen values).
Week 6	Solve System of Linear Equations by Gauss Elimination Method
Week 7	Solve System of Linear Equations by Gauss Elimination Method,
Week 8	M-file: Create in an M-file, function calling in MATLAB Programming with MATTAB, Use of Built-in Functions, Input Output, Structured Programming, Nesting and Indentation
Week 9	M-file: Create in an M-file, function calling in MATLAB Programming with MATTAB, Use of Built-in Functions, Input Output, Structured Programming, Nesting and Indentation
Week 10	Dealing with Errors and Pitfalls.
Week 11	Dealing with Errors and Pitfalls: Syntax Errors. Incompatible vector sizes. Name hiding. Logic and Rounding Error.
Week 12	Graphic plot: Graphics two-dimensions plots, Log-log and semi-log plots, Histograms plots. Linear Regression, Curve fitting.
Week 13	Graphic plot: Graphics two-dimensions plots, Log-log and semi-log plots, Histograms plots. Linear Regression, Curve fitting.
Week 14	Conditions and loops statements: Functions: if, else, else if, while, for, switch, break

Week 15	Conditions and loops statements: Functions: if, else, else if, while, for, switch, break
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction, Environment of MATLAB.
Week 2	Lab 2: Arithmetic Expressions.
Week 3	Lab 3: Vectors and Matrices.
Week 4	Lab 4: M-file: Create in an M-file.
Week 5	Lab 5: Graphic plot: Graphics two-dimensions plots.
Week 6	Lab 6: Dealing with Errors and Pitfalls.
Week 7	Lab 7: Conditions and loops statements.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Mark E. Davis “Numerical method and modelling for chemical engineers”.	Yes
Recommended Texts	Mathew J.H., Numerical Methods for Mathematics, Science and Engineering	Yes
Websites	https://www.mathworks.com/help/matlab/creating_guis/apps-overview.html	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Petroleum Refining			**Module Delivery**	
Module Type	**Core learning activity**			☐ **Theory** ☒ **Lecture** ☒ **Lab** **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	FEK201				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level		TCKII	**Semester of Delivery**		3
Administering Department		FE	**College**		
Module Leader	Assist lec. Asan Suad Mohammed		**e-mail**	assen.suad84@ntu.edu.iq	
Module Leader's Acad. Title		Assist Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date		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- refinery is to produce gasoline, diesel or asphalt, key objectives include improving return on investment (ROI), net profitability and cash flow. Great strides have been made in improving plant efficiency and productivity by implementing online, interactive compute.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Using the latest teaching methods and allowing students to discuss and evaluating the student's intellectual curiosity and imagination. 2-Expresses the role of petroleum refinery in engineering fields. 3- Ability to cope with ambiguity, positive interaction with others, common sense and good judgement 4-Explains the fundamentals of petroleum refinery. 5-Providing the ability to design systems to meet the required needs in the field of fuel and energy engineering. 6-Introducing students to contemporary techniques, skills and equipment in the engineering field. 7--Written and oral communication skills, initiative and sensitivity to the interests and views of others and ability to take directions.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: 1 - Thermophysical Properties of Petroleum Fractions and Crude Oils 2 - Crude Distillation, Catalytic Reforming and Isomerization. 3-Thermal cracking and cooking, hydro conversion 4-fluidised catalytic cracking, product blending, alkylation, hydrogen production Clean fuel residue upgrading.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم	
Strategies	Explanation of the concept of petroleum refinery can be done using various relevant methods and strategies to make it easier for students to understand, for example through laboratory or practicum activities, using problem-based learning, or problems solving. In this case, the learning can be a combination of conceptual understanding, exercises, and problem teaching. Problems are an important feature of petroleum refinery as it helps in developing thinking and serves to expand the field of interest, so the selection of problem sequences is an important aspect of increasing deductive and inductive reasoning.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	97	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

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, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	History and Development of Refining Processes,
Week 2	Kinds of Refineries, Refinery feed stocks and products.
Week 3	Classification and Evaluation of crude petroleum and its derivatives.
Week 4	Processing of Petroleum Liquids: Stabilization dehydration,
Week 5	Tube still heaters, Atmospheric and Vacuum Fractionation towers
Week 6	Material and Energy Balances, Refluxes, Temperature Distribution in Fractionation Tower.
Week 7	Upgrading the Distillates:
Week 8	Alkylation and Isomeric transformation,
Week 9	Catalytic polymerization, Thermal cracking processes,
Week 10	Catalytic polymerization
Week 11	Removal of Acid Gases, Sweetening Processes,
Week 12	Improvement in Performance and Storage Stability,
Week 13	Light End Fractioning. Refinery products and their
Week 14	Anti-foaming, and Dewaxing. Coking and treatment of bottom of the barrel,
Week 15	Residue upgrading, fuel additive

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Determination of density 1-Hydrometer method
Week 2	Determination of density ,1- Pycnometer method
Week 3	Determination of water and cediments in crude oil by centrifuge
Week 4	Determination of carbon residue in petroleum products
Week 5	Determination of ash content in petroleum products
Week 6	Determination of viscosity in petroleum products
Week 7	Determination of aniline point
Week 8	Determination of flash point
Week 9	Determination of ignition point
Week 10	Final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	W. L. Petroleum Refinery Engineering, Tata McGraw Hill Publishing Company Limited, 1985.	yes
Recommended Texts	Oil refinery operation book	yes
Websites		

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**

Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
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	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.

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	BAATH CRIMES			**Module Delivery**	
Module Type	BASIC			☒Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	NTU 200				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	2		**Semester of Delivery**	3	
Administering Department	RETE		**College**	College of Oil and Gas Techniques Engineering - Kirkuk, Northern Technical University, Iraq	
Module Leader	Dr. Osama Ali Ibrahim		**e-mail**	Osama@ntu.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	None		**e-mail**		
Peer Reviewer Name			**e-mail**		
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	اهداف هذه المادة الدراسية تشمل: 1. **فهم التاريخ:** دراسة جرائم نظام حزب البعث البائد قد تكون جزءًا من فهم أحداث التاريخ الحديث للمنطقة والبلدان المتأثرة به. 2. **تحليل الأحداث:** فحص الأحداث والتطورات التي وقعت خلال فترة حكم حزب البعث، مع التركيز على الأحداث التي تمثل انتهاكات لحقوق الإنسان وجرائم. 3. **العدالة وحقوق الإنسان:** فهم مفاهيم حقوق الإنسان والعدالة، وكيف يمكن تحقيق العدالة في ضوء الجرائم التي ارتكبها نظام حزب البعث. 4. **الدراسات القانونية:** التركيز على الجوانب القانونية لتلك الجرائم، وكيفية معالجتها من خلال النظام القانوني الوطني أو القانون الدولي. 5. **الوقاية والتعليم:** البحث عن السبل التي يمكن من خلالها تجنب تكرار مثل هذه الجرائم في المستقبل، وتعزيز التوعية حول أهمية حقوق الإنسان.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. **فهم التاريخ والسياق:** قدرة الطلاب على فهم وتحليل السياق التاريخي لحكم حزب البعث وكيف وقعت الجرائم خلال هذه الفترة. 2. **التحليل النقدي:** القدرة على تحليل الأحداث والمواقف بشكل نقدي، وتقييم تأثيرها على المجتمع وحقوق الإنسان. 3. **المعرفة القانونية:** فهم القوانين واللوائح التي تتعلق بالجرائم المرتبطة بنظام حزب البعث، وكيفية تطبيقها لتحقيق العدالة. 4. **التفكير النقدي:** تنمية مهارات التفكير النقدي والتحليل العميق للأحداث والظواهر المتعلقة بالموضوع. 5. **التوعية بحقوق الإنسان:** نشر الوعي حول حقوق الإنسان والتأكيد على أهميتها في منع تكرار مثل هذه الجرائم في المستقبل. 6. **التعامل مع مصادر المعلومات:** تنمية مهارات البحث والتحليل في استخدام مصادر موثوقة لفهم التاريخ وتقييم الأحداث. 7. **الكتابة والتواصل:** تحسين مهارات الكتابة والتعبير حول المواضيع ذات الصلة بجرائم نظام حزب البعث البائد. 8. **القدرة على التفاعل مع المحتوى الحساس**: تطوير القدرة على التفاعل مع المواضيع الحساسة بشكل مناسب واحترافي. هذه المخرجات يمكن أن تساهم في تأهيل الطلاب لفهم أعمق للموضوع وتطبيق المعرفة المكتسبة في سياقات مختلفة، سواء في المجال الأكاديمي أو في المجتمع بشكل عام.
Indicative Contents المحتويات الإرشادية	1. **جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005:** تتناول هذا الفصل مفهوم الجرائم وأقسامها وتعريف الجريمة لغة واصطلاحا وايضا دراسة مفصلة عن اقسام الجرائم الموجودة وبعدها يتم التطرق الى جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام 2005م واخيرا يتم التعرف على انواع الجرائم الدولية والقرارات الصادرة من المحكمة الجنائية العليا بحق مرتكبي الجرائم.

	2. **الجرائم النفسية والاجتماعية وآثارها، وأبرز انتهاكات النظام البعثي في العراق:** يتعلق ذلك بدراسة تأثير الجرائم النفسية والاجتماعية التي ارتكبها نظام حزب البعث على الفرد والمجتمع. وتتناول الآثار النفسية للانتهاكات والتعامل معها من منظور اجتماعي. وايضا الجرائم الاجتماعية وعسكرة المجتمع. ويترق هذا الفصل الى موقف النظام البعثي من الدين. ويشرح بشكل مفصل انتهاكات القوانين العراقية وصور واماكن السجون الاحتجاز لنظام البعث 3. **الجرائم البيئية لنظام البعث في العراق:** تشمل هذه المحتويات دراسة للتأثير البيئي لجرائم نظام حزب البعث، مثل التلوث البيئي والتدمير البيئي الناتج عن أفعال النظام من تلوث حربي واشعاعي وانفجار الالغام. اضافة الى تدمير المدن والقرى وتجفيف الاهوار وتجريف بساتين النخيل والاشجار والمزروعات. 4. **جرائم المقابر الجماعية:** يتناول هذا الجزء الجوانب القانونية والأخلاقية المتعلقة بجرائم المقابر الجماعية، واحداث مقابر الابادة الجماعية المرتكبة من النظام البعثي في العراق والتصنيف الزمني لمقابر الابادة الجماعية في العراق للمدة 1963م-2003م. هذه المحتويات تشير إلى تنوع وشمولية الموضوع، حيث يتم التطرق إلى الجوانب القانونية والاجتماعية والبيئية لجرائم نظام حزب البعث. و تشمل المادة الدراسية هذه أيضًا البحث عن حالات دراسية محددة وتحليلها لفهم عميق للسياق والتأثيرات.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**التعلم النشط والمشاركة الفعّالة:** • تشجيع الطلاب على المشاركة الفعالة في الدروس من خلال طرح أسئلة ومناقشات جماعية. • تنظيم أنشطة تعليمية تشجع على التفكير والنقاش وحل المشكلات. **التعلم من خلال التكنولوجيا:** • استخدام منصات التعلم الإلكتروني والتطبيقات التعليمية لتقديم المحتوى وتعزيز التفاعل والممارسة. • توفير مصادر عبر الإنترنت ومواد تعليمية متعددة الوسائط لتوجيه الطلاب في التعلم الذاتي. **التقييم المستمر والتغذية الراجعة:** • توفير تقييم دوري لأداء الطلاب من خلال اختبارات وواجبات. • تقديم تغذية راجعة فورية وإشراف لمساعدة الطلاب على تحسين مهاراتهم والتعلم تاريخ البلد ومعاناة الشعب العراقي خلال فترة حكم النظام البائد.

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	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.13
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**	5	20% (20)	2,4,6,8,10	LO #3, 6, 7,9, and 11
	Assignments	5	10% (10)	3,5,7,9,12	LO # 2, 8, 10,12, and 13
	Report	2	10% (10)	6,10	LO # 4, 9
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-6
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1-2	• جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام ٢٠٠٥ م • مفهوم الجرائم وأقسامها • جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام ٢٠٠٥ م
Week 3-4	• الجرائم النفسية والاجتماعية وأثارها، وأبرز انتهاكات النظام البعثي في العراق • الجرائم النفسية • اليات الجرائم النفسية • الجرائم الاجتماعية
Week 5-6	• الجرائم النفسية والاجتماعية وأثارها، وأبرز انتهاكات النظام البعثي في العراق • موقف النظام البعثي من الدين • انتهاكات القوانين العراقية • انتهاكات حقوق الانسان • بعض قرارات الانتهاكات السياسية
Week 7	• Mid-term exam
Week 8-9	• الجرائم البيئية لنظام البعث في العراق • التلوث الحربي والاشعاعي وانفجار الالغام • تدمير المدن والقرى (سياسة الارض المحروقة)
Week 10-12	• الجرائم البيئية لنظام البعث في العراق • تجفيف الاهوار • تجريف بساتين النخيل والاشجار والمزروعات
Week 13-14	• جرائم المقابر الجماعية • أحداث مقابر الابادة الجماعية المرتكبة من النظام البعثي في العراق

	• التصنيف الزمني لمقابر الابادة الجماعية في العراق للمدة 1963م – 2003م
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• القرآن الكريم • إحسان هندي، قوانين الاحتلال الحربي، حقوق السكان المدنيين في المناطق المحتلة وحمايتها، الإدارة السياسية، دمشق، ١٩٧٢ • أرشيف مؤسسة السجناء السياسيين. • أرشيف مؤسسة الشهداء • أرشيف المركز العراقي لتوثيق جرائم التطرف في العتبة العباسية المقدسة.	No
Recommended Texts	• ايمن عبد العزيز سلامة ، ال مسؤولية الدولية عن ارتكاب جريمة الابادة الجماعية ، ط ١، دار العلوم للنشر والتوزيع ، القاهرة ، ٢٠٠٦	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 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.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

Ministry of Higher Education and Scientific Research - Iraq
Northern Technical University
College of Oil & Gas Techniques Engineering/Kirkuk
Department of Fuel and Energy Engineering

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Engineering Workshops			**Module Delivery**	
Module Type	**Core**			☒ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	FEK 105				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	FEK		**College**	COGTEK	
Module Leader	Mohammed Z. Hasan with a group of technicians		**e-mail**	Mohamop49@ntu.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	M.Sc.	
Module Tutor	**Mohammed Z. Hasan**		**e-mail**	**mohamop49@ntu.edu.iq**	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	17/06/2023		**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-Study Workshop Skills by explaining principles of all workshop skills. 2-Explain a basic information about turning, milling, casting, welding, and other skills. 3-Use all available possibilities in workshop to explain skills to students. 4-Explain workshop skills theoretically and experimentally. 5- Show pupils How to manufacture all spare part experimentally.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Cognitive goals A1- Enhancing the analytical and practical abilities of the students by giving a complete summary of all the skills in the engineering workshops, a theoretical explanation of all the skills in the engineering workshops, which are as follows: engineering measurements, welding, filing, lathing, plumbing, grinding, scraping, milling and electrical installations in addition to their application Practically on the machines and devices in the workshops. B - The soft skills objectives of the course. Study the basic principles of skills for engineering workshops.
Indicative Contents المحتويات الإرشادية	Analyzing the results obtained by the student through conducting practical experiments and reaching the extent of their truth through. 1- Observation and perception 2- Analysis and interpretation 3- Conclusion and evaluation)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Weekly lectures included 1. Providing students with the basics and topics related to pre-skills education outcomes to solve practical problems through presentation, lecture or conducting experiments. 2. Solving a group of practical and applied examples by the academic staff. 3. Through discussion, students participate in solving some practical problems. 4. The department's practical laboratories are monitored by the department's academic staff. 5. Asking the student to visit the library and the international information network (the Internet) to obtain additional knowledge of the study subjects. Presenting a seminar (Seminar) by a student in front of his fellow students to enhance his confidence.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	65	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	85	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	160		

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, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري و التطبيقي	
	Material Covered
Week 1	Study the welding skill theoretically.
Week 2	Study the welding skill experimentally.
Week 3	Study the measurement skill theoretically.
Week 4	Study the measurement skill experimentally.
Week 5	Study the casting skill theoretically
Week 6	Study the casting skill experimentally.
Week 7	Study the turning skill theoretically.
Week 8	Study the turning skill experimentally
Week 9	Study the milling skill theoretically.
Week 10	Study the milling skill experimentally
Week 11	Study the carpentry skill theoretically.
Week 12	Study the carpentry skill experimentally
Week 13	Study car workshop skill theoretically.
Week 14	Study car workshop skill experimentally
Week 15	Study the car workshop skill experimentally
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Theory of Basic workshop skills with applications By By s. Gally math 2. 1- Workshop skill By Smith .jon	Yes

Recommended Texts		No
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	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 Northern Technical University College of Oil & Gas Techniques Engineering/Kirkuk Department of Fuel and Energy Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Engineering Mechanics**			**Module Delivery**	
Module Type	**Basic**				
Module Code	**FEK104**			☒ **Theory**	
ECTS Credits	**5**			☒**Seminar**	
SWL (hr/sem)	**125**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	COGTEK	
Module Leader	Mohammed Qader Abdulrahman		**e-mail**	Mohammed83@ntu.edu.iq	
Module Leader's Acad. Title	The lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**		
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	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	A study of mechanics gives you the basic tools to understand how the world, both natural an if you take the time to do this carefully, you will be well prepared for more advanced studies in engineering. Knowledge of mechanics is a fundamental tool for a mechanical engineer. Our p understand what has become known as classical mechanics. The concepts of classical mech with include a study of forces, motion, energy, work, momentum and heat, how these are con these ideas can be applied to engineering problems. The ideas behind classical mechanics ch race absolutely and forever. Most historians agree that no discovery in human thought has be Students come to engineering mechanics with an elementary understanding of the basic princ acquired from introductory school physics together with their application to problem solving. T emphasis on the basic skills (see Specific Outcomes below) required to start to apply these c principles to real engineering problem solving. The class focuses on the practice of these skill content. In this class doing required background reading, coming to class and doing homewo for a football team (or musical group, using a simple analogy). The tutor/lecturer is less a sour more of a coach (or conductor) who structures practice and sets standards. Students' progres (and regurgitating) information but rather by practising their skills individually and learning to w others. The exams are like league games (or concerts) where students test their skills in a situ performance counts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On completion of the module the student is expected to be able to: Have understood and overcome any misconceptions about basic concepts in physics (force, energy, work etc). Restate existing problem solving skills in a form more suitable for engineering applications Interpret basic engineering applications of mechanics in more detail. Acquire four basic thinking skills: • Perceive, or resolve, contradictions involving their preconceptions about mechanics • Organise the basic ideas of mechanics in a form suitable for problem solving • Apply basic principles in mechanics to realistic engineering situations • Solve realistic engineering problems
Indicative Contents المحتويات الإرشادية	**Introduction** **Basics of Statics** Fundamental principles & concepts: Vector algebra, Newton's laws, gravitation, force (external and internal, transmissibility), couple, moment

	(about point and about axis), Varignon's theorem, resultant of concurrent and non-concurrent coplanar forces, static equilibrium, free body diagram, reactions. Problem formulation concept; 2-D statics, two and three force members, alternate equilibrium equations. **Analysis of Structures** **Trusses**: Assumptions, rigid and non-rigid trusses; Simple truss (plane and space), method of joints. Simple truss by method of sections. Compound truss (statically determinate, rigid, and completely constrained). **Analysis of frames and machines**. **Beams**: types of loading and supports; shear force, bending moment, and axial force diagrams. Shear force and bending moment diagrams and equations relating them with external load. **Cables** (coplanar): assumptions, parabolic and catenary cables. **Friction** Coulomb dry friction laws, simple surface contact problems, friction angles, types of problems, wedges. Disk friction (thrust bearing); Belt friction (flat, V). Square-threaded screw (self-locking, screw jack). Journal bearings (axle friction). Wheel friction and rolling resistance. **Moments of Inertia** First moment of mass and center of mass, centroids of lines, areas, volumes, composite bodies. Area moments- and products- of inertia, radius of gyration, transfer of axes, composite areas. Rotation of axes, principal area-moments-of-inertia, Mohr's circle. Second moment of mass, Mass moments- and products- of inertia, radius of gyration, transfer of axes, flat plates (relation between area- and mass-moments- and products- of inertia), composite bodies. Rotation of axes, principal mass-moments-of-inertia. **Basics of dynamics** Rectilinear motion; Plane curvilinear motion (rectangular, path, and polar coordinates). 3-D curvilinear motion; Relative and constrained motion; Newton's second law (rectangular, path, and polar coordinates). Work-kinetic energy, power, potential energy. Impulse-momentum (linear, angular); Impact (Direct and oblique). **Plane kinematics of rigid bodies** Rotation; Parametric motion. Relative velocity, instantaneous center of rotation. Relative acceleration, rotating reference frames. Rotating reference frames, 3-part velocity and 5-part acceleration relations, Coriolis acceleration. Applications of rotating reference frames.

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 tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	65	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	60	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Homework.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	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

Week 2	Basics of Statics
Week 3	Analysis of Structures
Week 4	Vector addition
Week 5	Moment
Week 6	Moment of couple
Week 7	Resultant location
Week 8	Equilibrium
Week 9	Center of gravity
Week 10	The center for more than one shape
Week 11	Moments of Inertia
Week 12	Moments of Inertia for more than one shape
Week 13	Strength of material
Week 14	Basics of dynamics
Week 15	Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	[2] J. L. Meriam and L. G. Kraige, 'Engineering Mechanics: Statics (V.1), Dynamics (V.2)', 5th edition, Wiley 2002.	Yes
Recommended Texts	[1] F. P. Beer and E. R. Johnston, 'Vector Mechanics for Engineers: Statics (V.1), Dynamics (V.2)', 3rd SI edition, TMH, 1998.	No
Recommended Texts	[3] I. H. Shames, 'Engineering Mechanics: Statics & Dynamics', 4th edition, PHI, 1996.	No
Websites	https://www.wiley.com/en-us/Engineering+Mechanics%3A+Statics%2C+9th+Edition-p-9781119392620	

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
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	Ministry of Higher Education and Scientific Research - Iraq Northern Technical University College of Oil & Gas Techniques Engineering/Kirkuk Department of Fuel and Energy Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Analytical chemistry**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**FEK101**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	FEK		**College**	COGTEK	
Module Leader	**Dr. Najwa M.Latif**		**e-mail**	Najwa_alkarimi@ntu.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date	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 of the range and uses of analytical methods in chemistry. 2. To establish an appreciation of the role of chemistry in quantitative analysis 3. To develop an understanding of the broad role of the chemist in measurement and problem solving for analytical tasks. 4. To develop some understanding of the professional and safety responsibilities residing in working on chemical analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Expresses the role of analytical chemistry in engineering fields. 2. Explains the fundamentals of analytical chemistry and steps of a characteristic analysis. 3. Providing the ability to design systems to meet the required needs in the field of fuel and energy engineering. 4. Introducing students to contemporary techniques, skills and equipment in the engineering field. 5. Using the latest teaching methods and allowing students to discuss and evaluating the student's intellectual curiosity and imagination. 6. Written and oral communication skills, initiative and sensitivity to the interests and views of others and ability to take directions. 7. Ability to cope with ambiguity, positive interaction with others, common sense and good judgement 8. Using the analytical lab to develop meaningful problem-solving skills and to demonstrate and have students participate in the entire analytical process.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following.

	Part A - Analytical Chemistry The Analytical Process, obtaining a representative sample, Handling and storing samples, Problems associated with obtaining gross samples, Preparing the sample for analysis, Performing necessary chemical separations, Instrumental techniques, Instrument Standardization. Part B- Stoichiometric calculations The basics: atomic, molecular, and formula weights, moles, concentrations of solutions, density calculations, dilutions, solid samples, liquid samples. Revision problems volumetric analysis- titration, classification of titration methods, volumetric calculations, standardization and titration calculations, precipitation and complexometric titration reactions, back-titration, titer. Revision problems Part C - Acid–base equilibria Acid–Base Equilibria in Water, The pH Scale, Weak Acids and Bases, Salts of Weak Acids and Bases, Buffers. Acid–base titrations, strong acid versus strong base, weak acid versus strong base, weak base versus strong acid, titrations without measuring volumes, Complexes and Formation, Detection of the End Point, Effect of Acidity on Solubility of Precipitates, Precipitation Titrations. Revision problem classes

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Explanation of the concept of Analytical Chemistry can be done using various relevant methods and strategies to make it easier for students to understand, for example through laboratory or practicum activities, using problem-based learning, or problems

	solving. In this case, the learning can be a combination of conceptual understanding, exercises, and problem teaching. Problems are an important feature of analytical chemistry as it helps in developing analytical thinking and serves to expand the field of interest, so the selection of problem sequences is an important aspect of increasing deductive and inductive reasoning.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	127	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	8
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

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, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Basic concept of qualitative and quantitative analysis
Week 2	Qualitative and quantitative analytical method and concentrations
Week 3	Qualitative and quantitative analytical method and concentrations
Week 4	Principals of quantitative gravimetric analysis
Week 5	Stoichiometric of chemical analysis
Week 6	Stoichiometric of chemical analysis
Week 7	Mid-term Exam
Week 8	Chemical equilibrium and Chemical solubility
Week 9	Reactions of acids, bases
Week 10	pH for the acidic solutions
Week 11	Buffer solution
Week 12	Leader diagram
Week 13	Equilibrium in the oxidation and reduction reactions, equations of oxidation and reduction, indicators of oxidation and reduction.
Week 14	Equilibrium in the precipitation, solubility, precipitation and partial precipitation.
Week 15	Drawing of reaction curves in aqueous solution, construction of titration curves of aqueous solutions
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Preparation of solids
Week 2	Preparation of solution
Week 3	Standardization of HCl with a hydrous sodium carbonate
Week 4	Preparation and standardization of Acetic Acid with sodium hydroxide
Week 5	Determination of a mixture of sodium hydroxide and sodium carbonate
Week 6	Preparation and standardization of silver nitrate by Mohr's Method
Week 7	Mid-term Exam
Week 8	Determination of chloride ion by Mohr's Method
Week 9	Determination of chloride ion by Volhard Method
Week 10	Determination of Iron by potassium Dichromate
Week 11	Determination of water Hardness
Week 12	Analysis of soluble chloride by gravimetric method

Week 13	Analysis of iron solution by gravimetric Method
Week 14	Analysis of Nickel Oxide by gravimetric Method
Week 15	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	MAHIN, E. G. (1932). Quantitative Analysis ... Fourth Edition. United Kingdom: McGraw-Hill Book Company.	
Recommended Texts	Zumdahl, S. A., Zumdahl, S. S. (2014). Chemistry. United States: Cengage Learning.	
Websites	https://chem.libretexts.org/Bookshelves/Analytical_Chemistry/Analytical_Chemistry_2.1_(Harvey)	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
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	Ministry of Higher Education and Scientific Research - Iraq Northern Technical University College of Oil & Gas Techniques Engineering/Kirkuk Department of Fuel and Energy Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Engineering Drawing			**Module Delivery**	
Module Type	**Basic**			**Class Lecture** **Lab** **Practical**	
Module Code	COGTEK 101				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	COGTEK	
Module Leader	Rasha Sabah Aweid		**e-mail**	**Rashasabah@ntu.edu.iq**	
Module Leader's Acad. Title	Assistant lecturer		**Module Leader's Qualification**	Ms.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	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. Lectures. 2. Assigning students to do homework or writing research papers so that students can acquire self-learning and presentation skills. 3. Take sudden exams. 4. Conducting semester and final exams at the specified dates. 5. Inform students about how grades are calculated for students during the semester. 6. Providing textbooks and help books that they need in the vocabulary of the course. 7. Demonstrations such as: the smart board
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Cognitive goals 1. Broad education to understand the impact of engineering solutions globally and economically. 2. Ability to work in multidisciplinary teams. 3. The possibility of applying cognitive sciences such as mathematics, pure sciences and engineering. - 4. The ability to use the techniques, skills and tools of contemporary engineering in the engineering field. 5. The ability to design systems to meet the required needs through realistic determinants in terms of economics. - 6. The possibility of designing and implementing experiments, analyzing the results and translating them into reality.
Indicative Contents المحتويات الإرشادية	Emotional and value goals 1. The ability to make decisions. - 2. Methods of innovation among students. - 3. The student's ability to think. - 4. Collecting the data required to accomplish a specific subject.and their solutions. Time response (natural and step responses)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Lectures Graduation projects Creative thinking among students and keeping up with the latest scientific methods available in teaching and learning.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 محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	80	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	120	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

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, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري و العملي	
	Material Covered
Week 1	Introduction to engineering drawing.
Week 2	Setting up a drawing, setting the drawing units, drawing limits

Week 3	The line command, coordinates in Auto CAD, orthogonal mode, polar tracking, snap settings, object snaps
Week 4	Drawing commands: circle, arc, polyline, rectangle, ellipse, and polygon.
Week 5	view of drawing: panning, the zoom command, named views, user coordinate systems, isometric drawing
Week 6	Editing a drawing: selecting objects, erasing objects, moving objects, copying objects, rotating objects, scaling objects, mirror command, array command, offsetting objects, breaking objects, creating chamfered corners, creating rounded corners.
Week 7	Organizing drawings with layers, colors, line types, and line weights
Week 8	Drawing dimensions
Week 9	Geometrical construction
Week 10	Orthographic projection
Week 11	Pictorial drawing
Week 12	Sectional view
Week 13	Drawing in three dimensions, Creating solids
Week 14	Solid editing command
Week 15	Rendering in 3D
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	**1.** A.W.Bound, " Engineering Drawing".	Yes
Recommended Texts	**2.** Dhananjay A Jolhe, "Engineering drawing".	No
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	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 Northern Technical University College of Oil & Gas Techniques Engineering/Kirkuk Department of Fuel and Energy Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lab** ☐ **Tutorial** ☐ **Practical**	
Module Code	**NTU102**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	FEK		**College**	COGTEK	
Module Leader	Mohammed nazar hasan		**e-mail**	d.mnh2015@ntu.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	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 Learn how to use the computer and develop the student's skill 2. To understand the most important components and parts of the computer. 3. Learn the most important Microsoft Office applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Course Outcomes: At the end of the course, students are able to: 1. 1. Identify different types of computer hardware & software. 2. 2. Give a student the skill in the use of computers and service applications.
Indicative Contents المحتويات الإرشادية	Computer education is education that aims to create an interactive environment between the computer and the user (student, teacher, or any beneficiary), and enables him to access learning resources at any time and from anywhere. That is, education that relies on the use of electronic media in communication, receiving information, acquiring skills, and interaction between the student and the teacher, between the student and the school, and between the school and the teacher without the need for school buildings or classrooms.

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 محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	37	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	13	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	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, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Definition of the computer, components.
Week 2	Method of operation, simple diagram of the components and units of the computer. Phase's computers and the development of computers and the data and information
Week 3	Fields use of computers, Computer components, Types of Computers
Week 4	Folders Size and cascade, windows folder construction, construction choose file or 'older find, file or folder copy past Introduction.

Week 5	Computer software. Devices of input and output.Desktop, Mouse, my computer-icons, close window, stand by.
Week 6	Operations of the calculating by using Microsoft Excel program.
Week 7	Introduction. Menus and toolbars. Coordinating the cells and the worksheet window. Editing the cells. Operations of the calculating by using Microsoft Excel program.
Week 8	Drawing the charts by using Microsoft Excel program. Printing and printing options.
Week 9	Drawing the charts by using Microsoft Excel program. Printing and printing options.
Week 10	Introduction. The creating for Power Point slides. Using and modifying the design templates. Editing of the Power Point cells. Inserting pictures, text and tables in the presentation slides.
Week 11	Setup the auto showing of the presentation sides. Printing and printing setup to the Power Point slides.
Week 12	Definition of the Word program and the basic elements of the program.
Week 13	Introduction. Menus and toolbars. Coordinating the cells and the worksheet window. Editing the cells of the Word program.
Week 14	Editing the cells. Change write properties
Week 15	How to print and change font properties, search, arrange data
Week 16	Insert tables and pictures , symbols and Text box

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: components of the computer
Week 2	Lab 2: Method of operation simple diagram of the components and units of the computer
Week 3	Lab 3: Fields use of computers
Week 4	Lab 4: Folders Size and cascade, windows folder construction
Week 5	Lab 5: Operations of the calculating by using Microsoft Excel program.
Week 6	Lab 6: Editing the cells. Operations of the calculating by using Microsoft Excel program.
Week 7	Lab 7: Drawing the charts by using Microsoft Excel program. Printing and printing options.
Week 8	Lab 8: The creating for Power Point slides
Week 9	Lab 9: Printing and printing setup to the Power Point slides.
Week 10	Lab 10: How to run Word program

Week 11	Lab 11: Menus and toolbars. Coordinating the cells and the worksheet window. Editing the cells
Week 12	Lab 12: basic elements of the program
Week 13	Lab 13: How to print and change font properties
Week 14	Lab 14: Editing the cells. Change write properties
Week 15	Lab 15: How to print and change font properties, search, arrange data
Week 16	Lab 16: How you can Insert tables and pictures , symbols and Text box

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Exploring Microsoft Office 2019 Introductory , by Mary Poatsy (Author), Keith Mulbery (Author),Publisher : Pearson; 1st edition (June 1, 2021) Learn PC authoring A.P.Dr. Hassan Hadi.	Yes
Recommended Texts	Microsoft Office for Beginners by M.L. Humphrey, Publisher: M.L. Humphrey (July 23, 2020).	No
Websites	https://support.microsoft.com/en-us/training https://www.linkedin.com/learning/topics/microsoft-office?trk=lynda_redirect_learning	

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 Northern Technical University Technical Engineering College Kirkuk Department of Fuel and Energy Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**English Language 2**			**Module Delivery**	
Module Type				☒ **Theory** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	NTU200				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	2		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Fysal Gazi Bashaw		**e-mail**		
Module Leader's Acad. Title	Assistant lecturer		**Module Leader's Qualification**	Master	
Module Tutor	Name (if available)		**e-mail**		
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/10/2024		**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	The aim of this English Language Lecture is to provide students with a comprehensive understanding of the English language, including its structure, usage, and various linguistic aspects. The lecture aims to enhance students' language skills and improve their overall proficiency in English.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate a solid understanding of the fundamental aspects of English grammar, vocabulary, and syntax. 2. Apply effective reading strategies to comprehend and analyze a variety of written texts. 3. Produce coherent and well-structured written pieces using appropriate grammar, vocabulary, and style. 4. Listen actively and comprehend spoken English in various contexts, including formal and informal situations. 5. Engage in meaningful conversations and deliver clear and organized oral presentations in English. 6. Critically evaluate and analyze linguistic elements in literature, media, and other forms of communication. 7. Recognize and appreciate the historical and cultural contexts that have shaped the English language.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Introduction to the English language and its global significance. 2. Overview of English grammar, including parts of speech, sentence structure, and verb tenses. 3. Building vocabulary and word choice for effective communication. 4. Reading comprehension strategies and analysis of different types of texts. 5. Developing writing skills, including organization, coherence, and proper grammar usage. 6. Listening comprehension and effective note-taking techniques.

	7. Speaking skills development, including conversation, pronunciation, and presentation skills. 8. Literary analysis and interpretation of English language texts. 9. Historical and cultural influences on the English language. 10. Contemporary issues and challenges in the English language.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lecture delivery: The instructor will present concepts, explanations, and examples through interactive lectures, incorporating visual aids, multimedia resources, and real-life examples. 2. Group activities: Students will engage in group discussions, peer-to-peer interactions, and collaborative learning tasks to reinforce their understanding of concepts and develop their communication skills. 3. Practical exercises: Students will participate in individual and group exercises, such as grammar quizzes, writing assignments, and pronunciation drills, to apply their knowledge and receive feedback. 4. Multimedia resources: The lecture may incorporate audiovisual materials, online resources, and language learning software to provide a dynamic and interactive learning experience. 5. Assessments: Regular assessments, including quizzes, exams, and assignments, will be conducted to gauge students' progress and provide constructive feedback for improvement. 6. Self-directed learning: Students will be encouraged to engage in independent learning outside of the lecture through recommended readings, online resources, and language practice exercises.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	50	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	50	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	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	0	0	5, 12	LO #1, 3 and 7
	Assignments	0	30% (30)	4, 13	LO # 2, 4 and 6
	Projects / Lab.	0	0%		
	Report	1	20% (10)	13	All
Summative assessment	Midterm Exam	2 hr.	20% (30)	7	LO # 1-6
	Final Exam	2 hr.	30% (30)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	• Review of basic grammar: Verb tenses (present, past, future) • Words in English (Book 4)
Week 2	• Present perfect tense • Words in English (Book 4)
Week 3	• Modal verbs: Can, could, may, might, must, should • Words in English (Book 4)
Week 4	• writing letters and emails. • Words in English (Book 4)
Week 5	• Conditional sentences (Type 1) • Words in English (Book 4)
Week 6	• Reported speech (statements and questions) • Words in English (Book 4)
Week 7	• Mid-term Evaluation
Week 8	• Comparative and superlative adjectives and adverbs • Words in English (Book 4)
Week 9	• Passive voice • Words in English (Book 4)

Week 10	• Phrasal verbs • Words in English (Book 4)
Week 11	• Future forms: Going to, will, and present continuous. • Words in English (Book 4)
Week 12	• Prepositions: Time, place, and movement • Words in English (Book 4)
Week 13	• Reported speech (commands and requests) • Words in English (Book 4)
Week 14	• Relative clauses • Words in English (Book 4)
Week 15	• Review and reinforcement of previous topics before final term evaluation

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	English Grammar in Use by Raymond Murphy 5th edition	No
Recommended Texts	4000 Essential English words 2nd edition	No
Websites	http://www.duolingo.com/ http://www.bbc.co.uk/learningenglish	

Grading Scheme
مخطط الدرجات

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Northern Technical University
College of Oil & Gas Techniques Engineering/Kirkuk
Department of Fuel & Energy
Techniques Engineering

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	ARABIC LANGUAGE	**Module Delivery**	
Module Type	SUPPORT	☒Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	NTU 103		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	**Semester of Delivery**	2
Administering Department	FEK	**College**	College of Oil & Gas Techniques Engineering/Kirkuk
Module Leader	Dr.Osama Ibraheem Ali	**e-mail**	osama.ali@ntu.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's **Qualification**	Ph.D.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval	01/06/2023	**Version Number**	1.0

Relation with Other Modules
العلاقة مع المواد الدراسية الاخرى

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

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

Module Aims أهداف المادة الدراسية	1. تعزيز التواصل الفعال :يهدف تعلم اللغة العربية إلى تمكين الطلاب من التواصل بشكل فعال في البيئة العربية، سواء كان ذلك في الحياة اليومية أو في السياق الاكاديمي والعملي. 2. فهم الثقافة العربية :يعتبر تعلم اللغة العربية مفتاحا لفهم الثقافة العربية وقيمها، ويساعد الطلاب على التعرف على التراث العربي الغني وفهم تعدد الثقافات في العالم العربي. 3. تعزيز القدرات البحثية والاكاديمية :تعلم اللغة العربية يساهم في تطوير مهارات البحث والكتابة الاكاديمية للطلاب، مما يمكنهم من المشاركة بفاعلية في النقاشات الاكاديمية وإنتاج المعرفة. 4. .توفير فرص وظيفية :يعتبر إتقان اللغة العربية مهارة قيمة في سوق العمل، حيث يمكن للطلاب العربية العمل في مجالات متعددة مثل الترجمة، الاعلام، العلاقات العامة، والتعليم. 1.Enhancing effective communication: Teaching Arabic aims to enable students to communicate effectively in the Arab environment, both in daily life and in academic and professional contexts. ***2.*** Understanding Arab culture: Learning Arabic is a key to understanding Arab culture and its values, helping students to explore the rich Arab heritage and comprehend the cultural diversity within the Arab world. ***3.*** Enhancing research and academic skills: Learning Arabic contributes to developing research and academic writing skills for students, enabling them to actively participate in academic discussions and contribute to knowledge production. ***4.***Providing job opportunities: Proficiency in Arabic is a valuable skill in the job market, allowing students to
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. القدرة على التواصل الفعال :يكتسب الطلاب مهارات الاستماع والتحدث والقراءة والكتابة في اللغة العربية، مما يمكنهم من التواصل بطلاقة وفهم المحتوى بشكل صحيح**2**. 2. القدرة على فهم النصوص والثقافة :يتعلم الطلاب قراءة وفهم النصوص الادبية والثقافية باللغة العربية، مما يساهم في تطوير فهمهم للتراث العربي والتحليل النقديللاعمال الادبية. 3. القدرة على البحث والكتابة الاكاديمية :يتعلم الطلاب كيفية إجراء البحوث والكتابة الاكاديمية باللغة العربية، ويتمكنون من تقديم أوراق بحثية وتقارير أكاديمية بشكل متميز. 4. التفاعل الثقافي والاجتماعي :يتمكن الطلاب من المشاركة في المجتمع العربي بشكل أعمق وفهم التقاليد والقيم والعادات المحلية، مما يعزز التفاهم الثقافي والتعايش السلمي.

	1. Effective communication skills: Students acquire listening, speaking, reading, and writing skills in Arabic, enabling them to communicate fluently and understand content accurately. 2. Understanding texts and culture: Students learn to read and comprehend literary and cultural texts in Arabic, enhancing their understanding of Arab heritage and developing critical analysis of literary works. 3. Research and academic writing abilities: Students learn how to conduct research and engage in academic writing in Arabic, enabling them to present research papers and academic reports effectively. 4. Cultural and social interaction: Students are able to actively participate in the Arab community, gaining a deeper understanding of local traditions, values, and customs, fostering cultural understanding and peaceful coexistence.
Indicative Contents المحتويات الارشادية	1. مقدمة في المحتويات الاشارية :تعريف المحتويات الاشارية وأهميتها، ودورها في مجالات وتخصصات متنوعة. 2. أنواع وصيغ المحتويات الاشارية :استكشاف مختلف أنواع وصيغ المحتويات الاشارية، مثل الجداول والرسوم البيانية والنقاط البارزة والملخصات. 3. إنشاء المحتويات الاشارية :تقنيات واستراتيجيات إنشاء المحتويات الاشارية الفعالة، بما في ذلك اختيار المعلومات الرئيسية، وتبسيط المفاهيم المعقدة، وتنظيم المحتوى لسهولة الفهم. 4. التمثيل البصري للمحتويات الاشارية :استخدام الوسائط البصرية، مثل الرسوم البيانية والمخططات والرسومات، لتقديم المحتويات الاشارية بشكل جذاب ومفيد بصريا. 5. أمثلة ودراسات الحالة :تحليل أمثلة ودراسات حالة حقيقية لفهم كيفية استخدام المحتويات الاشارية في سياقات مختلفة، مثل التقارير البحثية ومواد التسويق والموارد التعليمية . 1. Introduction to Indicative Contents: Defining indicative contents and understanding their significance in various fields and disciplines. 2. Types and Formats of Indicative Contents: Exploring different types and formats of indicative contents, such as tables, charts, bullet points, and summaries. 3. Creating Indicative Contents: Techniques and strategies for effectively creating indicative contents, including selecting key information, simplifying complex concepts, and organizing content for easy comprehension. 4. Visual Representation of Indicative Contents: Utilizing visual aids, such as infographics, diagrams, and illustrations, to present indicative contents in an engaging and informative manner. 5. Examples and Case Studies: Analyzing real-life examples and case studies to understand how indicative contents are used in various contexts, such as research reports, marketing materials, and educational resources.
Learning and Teaching Strategies	

استراتيجيات التعلم والتعليم	
Strategies	1. Interactive Language Activities: Engaging students in interactive activities such as role-plays, group discussions, and language games to practice and reinforce language skills. 2. Communicative Approach: Emphasizing real-life communication and providing opportunities for students to actively engage in speaking, listening, reading, and writing tasks to develop their language proficiency. 3. Authentic Materials: Incorporating authentic materials such as newspaper articles, songs, videos, and literature to expose students to real-world language usage and cultural contexts

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	35	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	15	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	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**	4	30% (30)	3,6,10 and 14	LO #1, #2 , #3, and #4
	Assignments	2	10% (10)	4 and 12	LO #1and #4
	Projects / Lab.		0% (0)	0	0
	Report		0% (0)	0	0
Summative assessment	**Midterm Exam**	1hr	10% (10)	7	LO #1 - #2
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Language Errors:
Week 2	Taa Marbuta and Taa Marbuta (Bound and Open Taa): Understanding the rules and usage of the Taa Marbuta and Open Taa in Arabic language.
Week 3	Hamzat Al-Wasl and Al-Qat' (Hamza of Connection and Hamza of Disconnection): Differentiating between Hamzat Al-Wasl and Al-Qat' and their respective roles in pronunciation.
Week 4	Alif Al-Maddooda and Alif Al-Muqassara Writing Rules: Exploring the rules for writing Alif Al-Maddooda (elongated Alif) and Alif Al-Muqassara (shortened Alif).
Week 5	Solar and Lunar Letters: Identifying the distinction between solar and lunar letters in Arabic pronunciation.
Week 6	Adad (Numbers): Learning about the numerical system in Arabic and its usage.
Week 7	Verbs: Understanding verb conjugation and the different verb forms in Arabic.
Week 8	Parts of Speech: Exploring the different parts of speech, including nouns, verbs, adjectives, adverbs, etc.
Week 9	Meanings of Prepositions: Examining the meanings and usage of prepositions in Arabic.
Week 10	Common Language Errors: Analyzing common language errors and their applications in practical contexts.
Week 11	Noon and Tanween: Understanding the usage and pronunciation of Noon and Tanween in Arabic.
Week 12	Taa Marbuta and Taa Marbuta (Bound and Open Taa): Understanding the rules and usage of the Taa Marbuta and Open Taa in Arabic language.
Week 13	Hamzat Al-Wasl and Al-Qat' (Hamza of Connection and Hamza of Disconnection): Differentiating between Hamzat Al-Wasl and Al-Qat' and their respective roles in pronunciation.
Week 14	Alif Al-Maddooda and Alif Al-Muqassara Writing Rules: Exploring the rules for writing Alif Al-Maddooda (elongated Alif) and Alif Al-Muqassara (shortened Alif).
Week 15	Solar and Lunar Letters: Identifying the distinction between solar and lunar letters in Arabic pronunciation.
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. الكافية "للكندي :يعتبر من أهم الكتب في علم النحو، حيث يشرح. القواعد والتراكيب النحوية بأسلوب مبسط وشامل2. 2. الصرف "لابن مالك :كتاب مشهور يتناول قواعد تصريف الافعال والاسماء في اللغة العربية، ويعد من أعمال النحو الكلاسيكية. 3. المفصل في علم العربية "لابن جني :كتاب شامل يغطي مجموعة واسعة من موضوعات النحو والصرف والبلاغة والادب	Yes
Recommended Texts	1. الالفية "لابن مالك :كتاب مشهور في علم النحو والصرف، يعتبر من أهم المراجع الكلاسيكية في دراسة اللغة العربية. 2. المستطرف في كل فن مستظرف "لابن الانباري :كتاب يشمل العديد من الالفاظ والتعابير العربية المستخدمة في الادب والشعر. 3.البيان والتبيين "لابن حجر العسقلاني :كتاب يتناول موضوعات النحو والصرف والبلاغة، ويعتبر مرجعا قيما في دراسة اللغة العربية.	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 required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

	Ministry of Higher Education and Scientific Research - Iraq Northern Technical University Technical Engineering College Kirkuk Department of Fuel and Energy Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Material and Energy Balances**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Seminar**	
Module Code	**FEK309**				
ECTS Credits	**9**				
SWL (hr/sem)	**225**				
Module Level	2		**Semester of Delivery**	1	
Administering Department	FEK		**College**	Type College Code	
Module Leader	Morad A. Radha		**e-mail**	Morad.a.radha@ntu.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	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	our objectives in studying this module are to be able to 1. Develop a conceptual understanding of material balances 2. Understand the features of open, closed, steady-state, and unsteady-state systems 3. Express in words how to form the material balances for processes involving single or multiple components 4. Familiarize yourself with the strategy to assist you in solving material balance problems 5. Define or explain the following terms: energy, system, closed system, nonflow system, open system, flow system, surroundings, property, extensive property, intensive property, state, heat, work, kinetic energy, potential energy, internal energy, enthalpy, initial state, final state, state variable, cyclical process, path function, heat capacity 6. Select a system suitable for solving a problem, either closed or open, steady- or unsteady-state, and fix the system boundary 7. Convert energy in one set of units to another set 8. Understand each term in the general energy balance 9. Simplify the general energy balance for the specifics of a particular problem 10. Apply the general energy balance to open and closed systems, and to steady-state and unsteady-state systems
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the conclusion of this course, each student will be • Understand each term in the general Mass and energy balances. • Conscious with types of material balances strategies. • Solve problems related to material and energy balances. • Quickly locate the source of property values from tables, charts and equations. • Define or explain the following terms: energy, system, closed system, nonflow system, open system, flow system, surroundings, property, extensive property, intensive property, state, heat, work, kinetic energy, potential energy, internal energy, enthalpy, initial state, final state, state variable, cyclical process, path function, heat capacity.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Balances on Nonreactive Process Elements of energy balances. Change in pressure at constant temperature, sensible heat, heat capacities, energy balance on single-phase systems, and energy balance on phase change systems. Part B – Simultaneous Balances Material and energy balances on steady state processes, Heats of solution and mixing, latent heat of vaporization, Enthalpy calculation. Concentration charts, Partial saturation and humidity, Psychometric charts. Heats of reaction, Heats of formation, heat of combustion, adiabatic systems. Multiple unit system involving reaction, recycle, and purge. Part C - Balances on Transient Process Differential balance, integral balance, unsteady state material balances on non-reactive systems, unsteady state energy balances on reactive systems.

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 tutorials, online lecture, seminar and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	97	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	128	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	225		

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, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	10	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr + 1 hr lab	10% (10)	7	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	Revision to Material Balances
Week 2	Material Balances for a Single Component and multi component process
Week 3	Balances on Nonreactive Process
Week 4	Balances on reactive Process
Week 5	Balances on Combustion Process
Week 6	Crystallization Process
Week 7	Processes Involving Multiple Reactions
Week 8	Recycle, Bypass and Purge process without chemical reaction
Week 9	Recycle, Bypass and Purge process with chemical reaction
Week 10	Energy forms and calculations
Week 11	Latent heat of vaporization, Enthalpy calculation.
Week 12	Heats of reaction.
Week 13	Heats of formation.
Week 14	humidity, Psychometric charts.
Week 15	Problems including material and energy balances
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. David Basic principles and calculation in chemical engineering.	Yes
Recommended Texts	2. Richard M. Felder. Elementary principle of chemical processes.	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	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 Northern Technical University Technical Engineering College Kirkuk Department of Fuel and Energy Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Electric Technology**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**FEK205**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	2		**Semester of Delivery**	2	
Administering Department	FEK		**College**	tck	
Module Leader	Khalee Ali khudhur		**e-mail**	khaleel2012ali@ntu.edu.iq	
Module Leader's Acad. Title	Lecturer Assistance		**Module Leader's Qualification**	M.SC	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	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 problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchhoff's current and voltage Laws problems. 6. To perform mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Circuit Theory</u> DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis. [15 hrs]

	AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs] AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs] RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs] Revision problem classes [6 hrs] <u>Part B - Analogue Electronics</u> Fundamentals Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, input resistance, output resistance, coupling and decoupling capacitors, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs] Components and active devices – Components vs elements and circuit modeling, real and ideal elements. Introduction to sensors and actuators, self-generating vs modulating type sensors, simple circuit interfacing. [7 hrs] Diodes and Diode circuits – Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilization, voltage reference, power supplies. [15 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 tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	82	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	43	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction - Difference between Circuit Theory and Field Theory
Week 2	Basics of Network Elements
Week 3	Resistance and Resistivity, Ohm's Law and Inductance, Capacitance
Week 4	Review of Kirchhoff's Laws, Circuit Analysis - Nodal and Mesh
Week 5	Linearity and Superposition, Source Transformations, Thévenin and Norton Equivalents

Week 6	Review of Inductor and Capacitor as Circuit Elements, Source-free RL and RC Circuits, Transient Response
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Sinusoidal Forcing, Complex Forcing, Phasors, and Complex Impedance, Sinusoidal Steady State Response
Week 9	Nodal and Mesh Revisited, Average Power, RMS, Introduction to Polyphase Circuits
Week 10	Mutual Inductance, Linear and Ideal Transformers, Circuits with Mutual Inductance
Week 11	Frequency Response of Series/Parallel Resonances, High-Q Circuits
Week 12	Complex Frequency, s-Plane, Poles and Zeros, Response Function, Bode Plots
Week 13	Two Port Networks, Admittance, Impedance, Hybrid, and Transmittance Parameters
Week 14	Two Port Networks, Admittance, Impedance, Hybrid, and Transmittance Parameters
Week 15	Two Port Networks, Admittance, Impedance, Hybrid, and Transmittance Parameters
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to Agilent VEE and PSPICE
Week 2	Lab 2: Thévenin's / Norton's Theorem and Kirchhoff's Laws
Week 3	Lab 3: First-Order Transient Responses
Week 4	Lab 4: Second-Order Transient Responses
Week 5	Lab 5: Frequency Response of RC Circuits
Week 6	Lab 6: Frequency Response of RLC Circuits
Week 7	Lab 7: Filters

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	Yes
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	No

Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering

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.