



**Ministry of Higher Education and Scientific Research
University of Misan
College of Engineering
Department of Petroleum Engineering
Committee of Quality Assurance and Academic Accreditation**

**Academic Program and Course
Description Guide for the
Bachelor's Program in Petroleum
Engineering According to the
Bologna Process for the First,
Second and Third Stages**

2025–2026

Academic Program Description Form

University Name: University of Misan

Faculty/Institute: College of Engineering

Scientific Department: Petroleum Engineering Department

Academic or Professional Program Name: Bachelor's Petroleum Engineering

Final Certificate Name: Bachelor

Academic System: Bologna system (First, Second and Third Stage)

Description Preparation Date: 01/06/2025

File Completion Date: 01/07/2025

Signature:

Head of Department Name:

Assist. Prof. Dr. Jabbar Raheem Rashed

Date: 20/7/2025

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Scientific Associate Name:

Assist. Prof. Dr. Hassnin Abbas Hassan

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Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Assist. Prof. Dr. Fatin Ibrahim Musa

Date: 20/7/2025

Signature:

Approval of the Dean

Prof. Dr. Abbas Oda Dawood

23/7/2025

		University of Misan Bachelor's level (First cycle) - Honors Bachelor degree in Petroleum Engineering Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25hr Program Curriculum (2024 - 2025)										جامعة ميسان مستوى البكالوريوس (الدورة الأولى) - بكالوريوس مع مرتبة الشرف في هندسة النفط أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة اوروبية - كل وحدة اوروبية = ٢٥ ساعة المنهاج الدراسي للعام ٢٠٢٤-٢٠٢٥															
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)															
UGI	One	1	PE 111	General geology	الجيولوجيا العامة	English	3		2				3	78	47	125	5.00	B									
		2	ENG 122	Math I	الرياضيات I	English	3				2		3	78	47	125	5.00	B									
		3	UOM 122	Computer I	الحاسوب I	English	2		2				3	63	12	75	3.00	B									
		4	PE 112	Engineering Mechanics	الميكانيك الهندسي	English	2				2	1	3	78	72	150	6.00	B									
		5	UOM 121	Democracy and Humain Rights	الديمقراطية وحقوق الانسان	English	2						3	33	17	50	2.00	B									
		6	PE 113	Strength of Material	مقاومة المواد	English	2		2				3	63	62	125	5.00	B									
		7	ENG 123	Engineering Workshops	الورش الهندسية	English	1		2				3	48	2	50	2.00	B									
		8	UOM 123	Arabic Language I	اللغة العربية I	Arabic	2						3	33	17	50	2.00	B									
						Total	17	0	8	0	4	1	24	474	276	750	30.00										
	Two	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)																			
			1	PE 121	Sedimentology and Stratioranhv	الرسوبيات والطبقات	English	3		2											3	78	72	150	6.00	B	PE 111
			2	ENG 124	Math II	الرياضيات II	English	3				2									3	78	47	125	5.00	B	ENG 122
			3	ENG 125	Phises	الفيزياء	English	2				1									3	48	52	100	4.00	B	
			4	PE 122	Thermodynamic	ديناميك الحرارة	English	2				1	1								3	63	62	125	5.00	B	
			5	ENG 126	Chemistry	الكيمياء	English	2		2											3	63	37	100	4.00	B	
		6	UOM 120	English Language I	اللغة الإنكليزية I	English	2						3	33	17	50	2.00	B									
7	ENG 128	Engineering Drawing	الرسم الهندسي	English	1		3				3	63	37	100	4.00	B											
					Total	15	0	7	0	4	1	21	426	324	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)																						
UGII	Three	1	PE 211	Structural Geology	الجيولوجيا التركيبية	English	3		2				3	78	47	125	5.00	C									
		2	PE 212	Electrical Engineering Technol	تكنولوجيا الكهربائية	English	3		2				3	78	47	125	5.00	C									
		3	PE 213	Fluid Mechanics - Static	ميكانيك الموائع - الساكن	English	2				2		3	36	89	125	5.00	B									
		4	ENG 201	Applied Math I	الرياضيات التطبيقية III	English	2				2		3	63	62	125	5.00	B									
		5	PE 214	Petroleum Properties	خواص النفط	English	3		2				3	78	47	125	5.00	B									
		6	UOM 202	English Language II	اللغة الإنكليزية II	English	2					1	3	48	2	50	2.00	B									
		7	ENG 223	Engineering Ethics	اخلاقيات الهندسة	English	2					1	3	48	27	75	3.00	B									
						Total	17	0	6	0	4	2	18	429	321	750	30.00										
	UGII	Semester	No.	Module	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s)							
CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)																						

			Code			CL (hr/w) Lect (hr/w) Lab (hr/w) Pr (hr/w) Tut (hr/w) Semn (hr/w)						hr/sem	hr/sem	hr/sem			Code			
	Four	1	PE 221	Petroleum Geology	الجيولوجيا النفط	English	3		2				3	78	72	150	6.00	C	PE 211	
		2	ENG 202	Applied Math II	الرياضيات التطبيقية IV	English	2				2		3	63	62	125	5.00	B	ENG 201	
		3	PE 222	Fundamental Of Petroleum Eng	أسس هندسة النفط	English	2	2				3	63	87	150	6.00	C			
		4	ENG 127	Computer and Artificial intellig	الحاسوب II و الذكاء الاصطناع	English	2		2			3	63	12	75	3.00	B			
		5	PE 224	Fluid Mechanics - Dynamic	ميكانيك الموائع - الحركي	English	2		2		1	3	78	72	150	6.00	B			
		6	UOM 203	Arabic Language II	اللغة العربية II	Arabic	2					3	33	17	50	2.00	B			
		7	MNS 120	Bath crime party	جرائم نظام البعث	Arabic	2					3	33	17	50	2.00	B			
					Total		15	2	6	0	3	0	21	411	339	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	
UGII	Five	1	PE 311	Reservoir Engineering I	هندسة المكامن النفطية I	English	3		2		1		3	93	57	150	6.00	C		
		2	PE 312	Drilling Engineering I	هندسة الحفر I	English	3		2		1		3	93	57	150	6.00	C		
		3	PE 313	Production Engineering I	هندسة الإنتاج I	English	3				1		3	63	62	125	5.00	C		
		4	PE 314	Well Logging I	تخطيط الابار I	English	3				1		3	63	37	100	4.00	C		
		5	PE 315	Engineering Analysis	التحليلات الهندسية	English	3				1		3	63	37	100	4.00	B		
		6	PE 316	Petroleum Engineering Econon	اقتصاديات هندسة النفط	English	2				1		3	48	27	75	3.00	B		
		7	PE 317	Engineering Statistics	الإحصاء الهندسي	English	2						3	33	17	50	2.00	B		
					Total		19	0	4	0	6	0	21	456	294	750	30.00			
	Six	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
		Six	1	PE 321	Reservoir Engineering II	هندسة المكامن النفطية II	English	3		2		1		3	93	57	150	6.00	C	PE 311
			2	PE 322	Drilling Engineering II	هندسة الحفر II	English	3		2				3	93	57	150	6.00	C	PE 312
			3	PE 323	Production Engineering II	هندسة الإنتاج II	English	3				1		3	63	62	125	5.00	C	PE 323
			4	PE 324	Well Logging II	تخطيط الابار II	English	3				1		3	63	37	100	4.00	C	PE 314
			5	PE 325	Applied engineering Analysis	التحليلات الهندسية التطبيقية	English	3				1		3	63	37	100	4.00	B	
			6	PE 326	Pollution and industrial safety	التلوث والسلامة الصناعية	English	2						3	33	17	50	2.00	B	
7			PE 327	Geophysics	الجيوفيزياء	English	2				1		3	48	27	75	3.00	C		
				Total		19	0	4	0	6	0	21	456	294	750	30.00				
Note: The student should complete 4 weeks of Summer Internships to fulfill the requirements of the Bachelor of Science degree																				
Structured SWL (hr/w) type	CL	Class Lecture			Module type	B	Basic learning activities					SWL:	Student Workload							
	Lab	Laboratory				C	Core learning activity					SSWL:	Structured SWL							
	Pr	Practical Training				S	Support or related learning					USSWL:	Unstructured SWL							
	Tut	Tutorial				E	Elective learning activity													
	Lect	Online lecture																		
	Semn	Seminar																		

University of Misan

جامعة ميسان



First Cycle – Four Levels – 240 ECTS

Bachelor's Degree (B.Sc.) – Petroleum Engineering

الدورة الأولى - بكالوريوس هندسة النفط - أربع سنوات - ٢٤٠ وحدة ائتمانية



Table of Contents | جدول المحتويات

1. Vision & Mission Statement	بيان الرؤية والرسالة
2. Program Goals	أهداف البرنامج
3. Program Specification Overview	مواصفات البرنامج
4. Program learning outcomes	مخرجات تعلم الطالب على مستوى البرنامج الدراسي
5. Academic Staff	الهيئة التدريسية
6. Credits, Grading and GPA	الاعتمادات والدرجات والمعدل التراكمي
7. Modules	المواد الدراسية
8. Contact	اتصال

1. Vision & Mission Statement

Vision Statement

The Department of Petroleum Engineering at the College of Engineering, University of Misan aspires to become a leading academic and research programme at both the national and regional levels in the field of Petroleum Engineering. The Department is committed to delivering innovative, high-quality engineering education that aligns with international quality standards and the principles of the Bologna Process, while advancing scientific research, fostering innovation, and producing highly qualified graduates equipped with the knowledge, professional skills, and ethical values required to meet the evolving demands of the petroleum industry.

Mission Statement

The Department of Petroleum Engineering is committed to educating highly qualified petroleum engineers with strong theoretical knowledge and practical competencies in petroleum exploration, production, and reservoir management. The Department aims to equip graduates with engineering expertise, technical skills, critical thinking, problem-solving abilities, teamwork, and effective communication skills. It promotes the application of advanced technologies, numerical modelling, simulation, and artificial intelligence in petroleum engineering while fostering innovation, professional ethics, social responsibility, and lifelong learning to support the sustainable development of the Petroleum industry.

2. Program Goals

The Department of Petroleum Engineering aims to:

- Prepare qualified petroleum engineers with strong theoretical knowledge and practical skills in petroleum engineering.
- Develop students' technical and analytical skills through practical training, modern engineering tools, and problem-solving.
- Enhance communication, teamwork, leadership, and multidisciplinary collaboration for professional practice.
- Promote professional ethics, industrial safety, environmental responsibility, and sustainable engineering practices.
- Equip graduates with emerging technologies, including digital technologies and artificial intelligence, to meet industry needs.
- Encourage lifelong learning, research, innovation, and industry engagement to support sustainable development.

3. Program Specification Overview

Program code:	BSc-Pet	ECTS	240
Duration:	4 levels, 8 Semesters	Method of Attendance:	Full Time

The Bachelor of Science in Petroleum Engineering is a four-year undergraduate program designed in full compliance with the Bologna Process framework, comprising 240 ECTS credits distributed across eight semesters. The program follows the European Credit Transfer and Accumulation System (ECTS), where one ECTS credit corresponds to 25 hours of total student workload, including lectures, laboratory sessions, tutorials, field training, self-study, and assessment activities.

The curriculum is structured to provide students with a strong foundation in engineering sciences and petroleum engineering principles. During the first year, students study fundamental subjects such as mathematics, physics, chemistry, engineering drawing, computer applications, and introductory engineering sciences. In the subsequent years, the program progressively advances to specialized areas including petroleum geology, drilling engineering, reservoir engineering, production engineering, well testing, reservoir characterization, enhanced oil recovery, natural gas engineering, reservoir simulation, and petroleum economics.

The program allocates approximately 30% of the total credits to basic sciences and engineering fundamentals, 50% to core petroleum engineering courses, and 20% to technical and free elective courses, enabling students to broaden their knowledge in emerging areas of the petroleum and energy industries. Significant emphasis is placed on practical education, with extensive laboratory experiments, engineering workshops, field visits, summer industrial training, computer-based simulation, and a capstone graduation project that integrates engineering knowledge to solve real-world petroleum engineering challenges. Students are exposed to modern teaching and learning methodologies,

including interactive lectures, laboratory experiments, problem-based learning, project-based learning, engineering design activities, computer simulations, case studies, industrial seminars, and collaborative teamwork. The curriculum emphasizes the application of contemporary engineering software widely used in the petroleum industry for reservoir simulation, drilling design, production optimization, and engineering analysis.

The program learning outcomes are aligned with international engineering education standards and best practices, ensuring that graduates acquire comprehensive knowledge of petroleum exploration, drilling, reservoir evaluation, hydrocarbon production, and reservoir management. Graduates develop analytical and problem-solving abilities, engineering design competencies, professional ethics, communication and teamwork skills, and the ability to apply modern engineering tools while considering safety, environmental sustainability, and economic factors. The program prepares graduates for professional careers in upstream oil and gas companies, petroleum service industries, research and development organizations, governmental agencies, and consultancy firms, as well as for pursuing postgraduate studies and lifelong professional development in petroleum engineering and related disciplines.

4. Program Learning Outcomes

4.1 Knowledge and Understanding (K)

- K1.** Demonstrate comprehensive knowledge of mathematics, physics, chemistry, geology, and engineering sciences relevant to petroleum engineering.
- K2.** Explain the principles of petroleum geology, reservoir characterization, drilling, production, and well completion.
- K3.** Describe the physical and chemical properties of reservoir fluids and their influence on petroleum production.
- K4.** Understand reservoir engineering principles, fluid flow in porous media, and hydrocarbon recovery mechanisms.
- K5.** Explain the design, operation, and optimization of drilling, production, and surface processing systems.
- K6.** Understand enhanced oil recovery (EOR), reservoir management, and sustainable hydrocarbon production techniques.
- K7.** Demonstrate knowledge of health, safety, environmental (HSE), and risk management principles in petroleum operations.
- K8.** Understand the economic, environmental, legal, and ethical aspects of petroleum engineering and the role of the petroleum industry in sustainable energy development.

4.2 Intellectual/Cognitive Skills (C)

- C1.** Apply engineering principles to analyze and solve petroleum engineering problems.
- C2.** Evaluate geological, drilling, production, and reservoir data to support engineering decisions.
- C3.** Design appropriate engineering solutions for drilling, production, reservoir development, and field operations.
- C4.** Interpret laboratory, field, and simulation data using engineering judgment and scientific methods.

- C5.** Integrate multidisciplinary knowledge to optimize petroleum exploration, production, and reservoir management.
- C6.** Apply mathematical, statistical, and computational methods to analyze petroleum engineering data.
- C7.** Assess technical, economic, environmental, and safety factors when making engineering decisions.
- C8.** Develop innovative and sustainable solutions to challenges encountered in petroleum engineering

4.3 Practical and Professional Skills (P)

- P1.** Conduct laboratory experiments and field measurements using standard petroleum engineering techniques and procedures.
- P2.** Operate laboratory instruments and field equipment safely and effectively.
- P3.** Analyze rock, reservoir fluid, drilling fluid, and cement properties using appropriate laboratory methods.
- P4.** Apply drilling, well testing, production, and reservoir engineering techniques in practical and field settings.
- P5.** Use engineering software for reservoir simulation, well performance analysis, drilling design, production optimization, and data interpretation.
- P6.** Prepare engineering calculations, technical reports, and project documentation according to professional standards.
- P7.** Apply quality assurance, laboratory safety, and HSE regulations during engineering activities.
- P8.** Demonstrate professional responsibility and ethical conduct in petroleum engineering practice.

4.4 General and Transferable Skills (T)

- T1.** Communicate technical and scientific information effectively in both English and Arabic through written, oral, and graphical presentations.
- T2.** Work effectively as a member or leader of multidisciplinary engineering teams.
- T3.** Utilize modern engineering software, digital technologies, and information systems in petroleum engineering practice.
- T4.** Manage time, resources, and engineering projects efficiently to achieve project objectives.
- T5.** Prepare and deliver professional technical reports, presentations, and engineering documentation for diverse audiences.
- T6.** Locate, evaluate, and apply scientific, technical, and industrial literature to support engineering practice and lifelong learning.
- T7.** Demonstrate self-directed learning, continuous professional development, and adaptability to emerging technologies in the energy sector.
- T8.** Apply critical thinking, engineering judgment, and problem-solving skills to address complex petroleum engineering challenges while considering sustainability and societal needs.

5. Academic Staff

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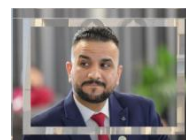
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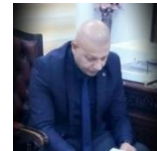
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6. Credits, Grading and GPA

Credits

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

Grading

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

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

Note: Marks with Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Calculation of the Cumulative Grade Point Average (CGPA)

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

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

$$\text{CGPA} = [(1\text{st module score} \times \text{module ECTS}) + (2\text{nd module score} \times \text{module ECTS}) + (3\text{rd module score} \times \text{module ECTS}) + \dots + (\text{last module score} \times \text{module ECTS})] / 240$$

7. Curriculum/Modules

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

Code	Module	SSWL	USSWL	ECTS	Type	Prerequisite
PE 111	General geology	78	47	5.00	B	
ENG 122	Math 1	78	47	5.00	B	
UOM 122	Computer I	63	12	3.00	B	
PE 112	Engineering Mechanics	78	72	6.00	B	
UOM 121	Democracy and Human Rights	33	17	2.00	B	
PE 113	Strength of Material	63	62	5.00	B	
ENG 123	Engineering Workshops	48	2	2.00	B	
UOM 123	Arabic Language I	33	17	2.00	B	

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

Code	Module	SSWL	USSWL	ECTS	Type	Prerequisite
PE 121	Sedimentology and Stratigraphy	78	72	6.00	B	PE 111
ENG 124	Math II	78	47	5.00	B	ENG 122
ENG 125	Physics	48	52	4.00	B	
PE 122	Thermodynamic	63	62	5.00	B	
ENG 126	Chemistry	63	37	4.00	B	
UOM 120	English Language I	33	17	2.00	B	
ENG 128	Engineering Drawing	63	37	4.00	B	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Prerequisite
PE 211	Structural Geology	78	47	5.00	C	
PE 212	Electrical Engineering Technology	78	47	5.00	C	
PE 213	Fluid Mechanics - Static	36	89	5.00	B	
ENG 201	Applied Math I	63	62	5.00	B	
PE 214	Petroleum Properties	78	47	5.00	B	
UOM 202	English Language II	48	2	2.00	B	
ENG 223	Engineering Ethics	48	27	3.00	B	

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Prerequisite
PE 221	Petroleum Geology	78	72	6.00	C	PE 211
ENG 202	Applied Math II	63	62	5.00	B	ENG 201
PE 222	Fundamental Of Petroleum Engineering	63	87	6.00	C	
ENG 127	Computer and Artificial intelligence	63	12	3.00	B	
PE 224	Fluid Mechanics - Dynamic	78	72	6.00	B	
UOM 203	Arabic Language II	33	17	2.00	B	
MNS 120	Bath crime party	33	17	2.00	B	

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Prerequisite
PE 311	Reservoir Engineering I	93	57	6.00	C	
PE 312	Drilling Engineering I	93	57	6.00	C	
PE 313	Production Engineering I	63	62	5.00	C	
PE 314	Well Logging I	63	37	4.00	C	
PE 315	Engineering Analysis	63	37	4.00	B	
PE 316	Petroleum Engineering Economics	48	27	3.00	B	
PE 317	Engineering Statistics	33	17	2.00	B	

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSW L	ECTS	Type	Prerequisite
PE 321	Reservoir Engineering II	93	57	6.00	C	PE 311
PE 322	Drilling Engineering II	93	57	6.00	C	PE 312
PE 323	Production Engineering II	63	62	5.00	C	PE 323
PE 324	Well Logging II	63	37	4.00	C	PE 314
PE 325	Applied engineering Analysis	63	37	4.00	B	
PE 326	Pollution and industrial safety	33	17	2.00	B	
PE 327	Geophysics	48	27	3.00	C	

8. Contact

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University of Misan

جامعة ميسان



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

بكالوريوس - هندسة نفط



Table of Contents

1. Overview
 2. Undergraduate Modules (Program 2024-2025)
 3. Contact
-

1. Overview

This catalogue is about the courses (modules) given by the program of petroleum Engineering to gain the Bachelor of Science degree. The program delivers (36) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظرة عامة

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج هندسة النفط للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (٣٦) مادة دراسية، على سبيل المثال، مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2025-2026

Module 1

Code	Course/Module Title	ECTS	Semester
PE111	General geology	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
General Geology is a foundational module in petroleum engineering that introduces students to the fundamental principles of geology and its relevance to the exploration and production of oil and gas. The module provides an overview of the Earth's structure, composition, and geological processes, focusing on topics essential for understanding petroleum systems. The General Geology module provides petroleum engineering students with a solid foundation in geological principles, allowing them to understand the geological characteristics of oil and gas reservoirs and make informed decisions during exploration and production activities. It serves as a basis for further specialized studies in areas such as reservoir characterization, formation evaluation, and seismic interpretation.			

Module 2

Code	Course/Module Title	ECTS	Semester
ENG 122	Math 1	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
The Mathematics module in a Petroleum Engineering department focuses on providing students with a solid foundation in mathematical concepts and tools that are essential for solving engineering problems in the field of petroleum engineering. The Mathematics module provides students with the necessary mathematical tools to analyze, model, and solve engineering problems encountered in the petroleum industry. It helps students develop quantitative skills and critical thinking abilities, enabling them to apply mathematical concepts to real-world scenarios in petroleum engineering.			

Module 3

Code	Course/Module Title	ECTS	Semester
UOM 122	Computer 1	3	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	12
Description			
This module introduces students to the fundamental principles of computer programming and its applications in the field of petroleum engineering. It aims to equip students with programming skills to solve engineering problems, analyze data, and develop software tools for various petroleum engineering tasks. The Computer Programming module provides petroleum engineering students with a strong foundation in programming concepts and techniques, enabling them to leverage computational tools and algorithms to solve industry-specific problems efficiently. By acquiring programming skills, students enhance their problem-solving abilities and become well-equipped to navigate the digital landscape of the petroleum industry.			

Module 4

Code	Course/Module Title	ECTS	Semester
PE 112	Engineering Mechanics	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	78	72
Description			
Engineering Mechanics: This module focuses on the fundamental principles of engineering mechanics and the behavior of materials under various loads and conditions. It provides a solid foundation for understanding the mechanical aspects of petroleum engineering. The module "Engineering Mechanics " provides students with a strong understanding of the fundamental principles that govern the behavior of materials and structures. This knowledge is essential for designing and analyzing various components and systems in petroleum engineering, such as wellbore casings, offshore structures, and pipelines			

Module 5

Code	Course/Module Title	ECTS	Semester
UOM 121	Human Rights & Democracy	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0	33	17
Description			
The study of the Democracy concept and history and its relationship to religions and relations with Development, also the advantages and the disadvantages of democracy, to know the democracy and how can adapt our culture with the principles of democracy in general. Lock of student to their own cultural inventories in the concepts of democratization and it has been shining in the emergence of a democratic culture in university community with the intimate and external community.			

Module 6

Code	Course/Module Title	ECTS	Semester
PE 113	Strength Of Material	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	62
Description			
Strength of Materials: This module focuses on the fundamental principles of Strength Of Material and the behavior of materials under various loads and conditions. It provides a solid foundation for understanding the mechanical aspects of petroleum engineering. The module " Strength of Materials" provides students with a strong understanding of the fundamental principles that govern the behavior of materials and structures. This knowledge is essential for designing and analyzing various components and systems in petroleum engineering, such as wellbore casings, offshore structures, and pipelines			

Module 7

Code	Course/Module Title	ECTS	Semester
ENG 123	Engineering Workshops	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	2	48	2
Description			
Engineering Workshop is of immense importance for undergraduate petroleum engineering students. It provides hands-on experience with tools, equipment, and practical skills essential to the field. Through workshops, students gain knowledge in machining, welding, fabrication, and assembly, allowing them to create prototypes and work on real-world projects. It fosters problem-solving abilities, critical thinking, and an understanding of material properties and manufacturing processes. Additionally, workshops promote teamwork, communication, and safety awareness. Practical experience gained in the workshop enhances the students' overall understanding of engineering principles, boosts their confidence, and prepares them for the challenges they may encounter in their future careers as chemical engineers.			

Module 8

Code	Course/Module Title	ECTS	Semester
UOM 123	Arabic Language 1	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	.	33	17
Description			
ان الهدف من تدريس مادة اللغة العربية في هذا القسم هو الكفاءة اللغوية للطلبة وتمكينهم من التعبير عن أفكارهم ومشاريعهم بلغة عربية فصيحة واضحة خالية من الغلط واللون العامي والاعجمي بأبسط الطرق . فاللغة هي أداة الايصال الأولى بين أفراد المجتمع، ومتى تمكن الإنسان من لغته استطاع الوصول الى أذهان الآخرين بحيث يسهل تعامله معهم ويتمكن من تحقيق هدفه في العمل. وان ذلك يؤدي الى تحقيق التوازن المفترض في ثقافة الطلبة فهو يضمن نوعاً من التعادل بين مناهج المادة العلمية ووسيلة ابصالها او التعبير عنها.			

Second Semester
Module 1

Code	Course/Module Title	ECTS	Semester
PE 121	Sedimentary and Stratigraphy	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	72
Description			
Sedimentary and Stratigraphy: This module focuses on the study of sedimentary basins and the topographic features that influence the formation, accumulation, and exploration of oil and gas reserves. It involves understanding the processes and factors that contribute to the deposition and preservation of sediments, as well as the analysis of surface features and landforms that provide valuable geological information. Understanding sedimentary processes, environments, stratigraphy, basin analysis, and topographic features is crucial for petroleum engineers. It allows them to assess the geological conditions, predict the distribution of oil and gas reservoirs, and plan exploration and production activities effectively. This module provides students with the necessary knowledge to analyze and interpret the geological aspects relevant to petroleum exploration and production in sedimentary basins.			

Module 2

Code	Course/Module Title	ECTS	Semester
ENG 124	Math 2	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
The Mathematics module in a Petroleum Engineering department focuses on providing students with a solid foundation in mathematical concepts and tools that are essential for solving engineering problems in the field of petroleum engineering. The Mathematics module provides students with the necessary mathematical tools to analyze, model, and solve engineering problems encountered in the petroleum industry. It helps students develop quantitative skills and critical thinking abilities, enabling them to apply mathematical concepts to real-world scenarios in petroleum engineering.			

Module 3

Code	Course/Module Title	ECTS	Semester
ENG 125	Physics	4	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	52
Description			
The Physics module in a Petroleum Engineering department focuses on the fundamental principles of physics as they apply to the oil and gas industry. It provides students with a solid understanding of the physical properties of fluids and the behavior of energy in various systems. The Physics module provides the foundational knowledge necessary for petroleum engineers to analyze and solve engineering problems related to fluid flow. It serves as a basis for more advanced modules in areas such as reservoir engineering, production engineering, and well design.			

Module 4

Code	Course/Module Title	ECTS	Semester
PE 122	Thermodynamic	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	62
Description			
Thermodynamics module in a Petroleum Engineering department focuses on the fundamental principles of thermodynamics as they apply to the oil and gas industry. It provides students with a solid understanding of the physical properties of fluids and the behavior of energy in various systems. The Thermodynamics module provides the foundational knowledge necessary for petroleum engineers to analyze and solve engineering problems related to fluid flow, heat transfer, and energy conversion. It serves as a basis for more advanced modules in areas such as reservoir engineering, production engineering, and well design.			

Module 5

Code	Course/Module Title	ECTS	Semester
ENG 126	Chemistry	4	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	37
Description			
Analytical Chemistry: Analytical Chemistry is a module within the petroleum engineering department that focuses on the principles and techniques used to analyze and characterize various substances related to the oil and gas industry. It provides students with a strong foundation in chemical analysis methods that are essential for understanding and solving problems in petroleum engineering. The Analytical Chemistry module equips petroleum engineering students with the necessary skills to analyze and interpret chemical data relevant to the oil and gas industry. It enables them to evaluate the quality of petroleum products, assess environmental impacts, and make informed decisions based on analytical results.			

Module 6

Code	Course/Module Title	ECTS	Semester
UOM 120	English language	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
English Language Module: The English language module is designed to enhance students' communication skills in English, specifically tailored to the needs of petroleum engineering professionals. It aims to develop their language proficiency, both in written and spoken English, to effectively communicate technical concepts and ideas in the field of petroleum engineering. The English language module aims to equip petroleum engineering students with the necessary language skills to thrive in an international and technical environment. By improving their English proficiency, students can effectively communicate their ideas, research findings, and technical knowledge within the petroleum engineering industry.			

Module 7

Code	Course/Module Title	ECTS	Semester
ENG 128	Engineering Drawing	4	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	3	63	37
Description			
Engineering drawings provide a visual representation of complex systems and processes, allowing engineers to convey ideas, designs, and specifications accurately. Understanding drawing conventions, symbols, and dimensions enables chemical engineers to interpret and create technical drawings, fostering collaboration and ensuring precise implementation of projects. Proficiency in Engineering Drawing Basics also enhances problem solving skills, as it aids in analyzing and troubleshooting complex equipment and processes. Moreover, it enables effective documentation and record-keeping, ensuring safety, compliance, and seamless project management. Ultimately, mastering these fundamentals empowers chemical engineering students to excel in their future careers.			

2. Level II

First semester

Module 1

Code	Course/Module Title	ECTS	Semester
PE 211	General geology	5	1
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
Structural Geology: Structural geology is a module within the petroleum engineering department that focuses on the study of geological structures and their significance in the exploration and production of hydrocarbons. It explores the deformation and tectonic processes that have shaped the Earth's crust and their implications for the distribution and behavior of subsurface reservoirs. The Structural Geology module provides petroleum engineering students with a fundamental understanding of geological structures and their importance in hydrocarbon exploration and production. It enables them to analyze and interpret subsurface data, assess reservoir potential, and make informed decisions regarding well placement, drilling operations, and reservoir management.			

Module 2

Code	Course/Module Title	ECTS	Semester
PE 212	Electrical Engineering Technology	5	1
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
The Electrical Engineering module in Petroleum Engineering focuses on the application of electrical principles and technologies in the oil and gas industry. It equips students with the knowledge and skills necessary to design, maintain, and troubleshoot electrical systems and equipment used in various petroleum operations. The Electrical Engineering module in Petroleum Engineering prepares students to work on various electrical aspects of the oil and gas industry, including drilling operations, production facilities, refineries, and distribution systems. It provides them with a strong foundation in electrical engineering principles and their specific applications in the petroleum sector.			

Module 3

Code	Course/Module Title	ECTS	Semester
PE 213	Fluid Mechanics (static)	5	1
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	62
Description			
Fluid Mechanics is a fundamental module in petroleum engineering that focuses on the behavior and properties of fluids, particularly liquids and gases, within the context of oil and gas operations. This module covers the principles and laws governing fluid flow, providing students with a solid foundation for understanding various fluid-related processes encountered in the petroleum industry. Understanding Fluid Mechanics is crucial for petroleum engineers as it is relevant to numerous processes in the industry, such as well drilling, fluid transport through pipelines, oil and gas production, and reservoir engineering. It provides the necessary knowledge to analyze and solve fluid-related problems encountered in various petroleum engineering disciplines.			

Module 4

Code	Course/Module Title	ECTS	Semester
ENG 201	Applied Math I	5	1
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	62
Description			
Applied Math I is a foundational module in the petroleum engineering curriculum that focuses on mathematical principles and techniques applicable to various engineering problems encountered in the oil and gas industry. This module aims to equip students with the mathematical skills necessary for analyzing and solving engineering problems in their future career. Throughout the module, students are encouraged to apply the mathematical concepts and techniques learned to solve practical problems encountered in petroleum engineering, such as well performance analysis, fluid flow in porous media, and reservoir characterization. By completing the Applied Math I module, students gain a solid mathematical foundation that enables them to tackle more advanced engineering courses and apply mathematical principles to solve complex problems in the petroleum industry.			

Module 5

Code	Course/Module Title	ECTS	Semester
PE 214	Petroleum Properties	5	1
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	47
Description			
The Petroleum Properties module focuses on the study of the physical and chemical properties of petroleum fluids. It is essential for petroleum engineers to understand these properties as they directly influence the behavior of hydrocarbon reservoirs and the design of production and refining processes. By studying Petroleum Properties, students gain a comprehensive understanding of the behavior and characteristics of petroleum fluids. This knowledge is crucial for making informed decisions in reservoir management, production optimization, and field development planning.			

Module 6

Code	Course/Module Title	ECTS	Semester
UOM 202	English Language II	2	1
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	2
Description			
English Language II: The Technical English module is designed to improve students' communication skills in the specific context of petroleum engineering. This module focuses on developing language proficiency in reading, writing, speaking, and listening, with a particular emphasis on technical vocabulary, terminology, and concepts related to the oil and gas industry. The overall goal of the Technical English module is to equip petroleum engineering students with the necessary language skills and confidence to effectively communicate within their field. By improving their technical English proficiency, students can enhance their professional prospects, collaborate with colleagues from different backgrounds, and stay updated with the latest advancements in the petroleum industry.			

Module 7

Code	Course/Module Title	ECTS	Semester
ENG 223	Engineering Ethics	3	1
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	27
Description			
The module of Engineering Ethics in a petroleum engineering department focuses on the ethical considerations and responsibilities that professionals in the field of petroleum engineering should uphold. It addresses the moral and ethical dilemmas that may arise in the industry and helps students develop a strong ethical framework to make responsible decisions throughout their careers. The Engineering Ethics module aims to instill a sense of ethical awareness and responsibility in petroleum engineering students. It encourages them to consider the broader societal, environmental, and human impact of their professional decisions, promoting ethical behavior and integrity in their future careers.			

Second Semester

Module 1

Code	Course/Module Title	ECTS	Semester
PE 221	Petroleum Geology	6	2
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	78	72
Description			
Petroleum Geology: The module on Petroleum Geology focuses on the study of subsurface geological formations to identify and evaluate potential oil and gas reservoirs. It combines principles of geology, sedimentology, stratigraphy, and structural geology to understand the origin, distribution, and characteristics of hydrocarbon deposits. The Petroleum Geology module provides students with the necessary knowledge and skills to understand the geological aspects of hydrocarbon exploration and production. By studying the subsurface geology, students can contribute to the identification and development of viable oil and gas reserves, supporting the overall field development and production operations in the petroleum industry.			

Module 2

Code	Course/Module Title	ECTS	Semester
ENG 202	Applied Math 2	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	62
Description			
Applied Math 2 is a module within the petroleum engineering department that focuses on the application of mathematical concepts and techniques to solve engineering problems specifically related to the oil and gas industry. It builds upon the foundational knowledge acquired in Applied Math 1 and provides further mathematical tools and methods that are relevant to petroleum engineering. The Applied Math 2 module equips petroleum engineering students with the necessary mathematical tools and techniques to analyze, model, and solve complex engineering problems encountered in the oil and gas industry. It enables students to apply mathematical concepts effectively in their future work, research, and decision-making processes.			

Module 3

Code	Course/Module Title	ECTS	Semester
PE 222	Fundamental Of Petroleum Engineering	6	2
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	87
Description			
The module "Fundamentals of Petroleum Engineering serves as an introductory course in petroleum engineering, providing students with a foundational understanding of key concepts and principles in the field. "Fundamentals of Petroleum Engineering provides students with a solid foundation in the fundamental principles and concepts of petroleum engineering. It lays the groundwork for more advanced modules in the discipline and equips students with the necessary knowledge to analyze reservoirs, evaluate production potential, and make informed engineering decisions. أعلى النموذج			

Module 4

Code	Course/Module Title	ECTS	Semester
ENG 127	Computer and Artificial intelligence	3	2
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	63	12
Description			
The Computer and Artificial intelligence Programming module is designed to equip petroleum engineering students with the essential programming skills and knowledge required to leverage computational tools and software for various tasks in the industry. It enables them to develop software solutions, analyze large datasets, and automate repetitive tasks, enhancing their efficiency and productivity in their future careers. Additionally, programming skills are becoming increasingly valuable in the petroleum industry as technology and digitalization play a more significant role in optimizing operations and decision-making processes.			

Module 5

Code	Course/Module Title	ECTS	Semester
PE 224	Fluid Mechanics (Dynamic)	6	2
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	78	72
Description			
Fluid Mechanics is a fundamental module in petroleum engineering that focuses on the behavior and properties of fluids, particularly liquids and gases, within the context of oil and gas operations. This module covers the principles and laws governing fluid flow, providing students with a solid foundation for understanding various fluid-related processes encountered in the petroleum industry. Understanding Fluid Mechanics is crucial for petroleum engineers as it is relevant to numerous processes in the industry, such as well drilling, fluid transport through pipelines, oil and gas production, and reservoir engineering. It provides the necessary knowledge to analyze and solve fluid-related problems encountered in various petroleum engineering disciplines.			

Module 6

Code	Course/Module Title	ECTS	Semester
UOM 203	Arabic Language 2	2	1
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	.	33	17
Description			
ان الهدف من تدريس مادة اللغة العربية في هذا القسم هو الكفاءة اللغوية للطلبة وتمكينهم من التعبير عن أفكارهم ومشاريعهم بلغة عربية فصيحة واضحة خالية من الغلط واللون العامي والاعجمي بأبسط الطرق . فاللغة هي أداة الاتصال الأولى بين أفراد المجتمع، ومتى تمكن الإنسان من لغته استطاع الوصول الى أذهان الآخرين بحيث يسهل تعامله معهم ويتمكن من تحقيق هدفه في العمل. وان ذلك يؤدي الى تحقيق التوازن المفترض في ثقافة الطلبة فهو يضمن نوعاً من التعادل بين مناهج المادة العلمية ووسيلة ايصالها او التعبير عنها.			

Code	Course/Module Title	ECTS	Semester
MNS 120	جرائم البعث Bath crime party	2	2
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2		٣٣	١٧
Description			
جرائم حزب البعث: صمم هذا البرنامج للتعرف والاطلاع على مجموعة من الجرائم التي ارتكبتها حزب البعث البائد والمنحل بحق أبناء الشعب العراقي ومن مختلف المكونات لأطيافه ولتأسيس وعي للطلبة لرفض جميع اشكال الظلم والتسلط لهذه الأنظمة والمطالبة بجميع الحقوق المدنية والسياسية			

3. level III

First semester

Module 1

Code	Course/Module Title	ECTS	Semester
PE 311	Reservoir Engineering I	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/w)
3	3	93	57
Description			
Reservoir Engineering is an introductory module that focuses on the fundamental concepts and principles of reservoir engineering in the oil and gas industry. The module provides students with a solid foundation in understanding reservoir characteristics, behavior, and management. Reservoir Engineering provides students with the necessary knowledge and skills to analyze reservoir behavior, predict performance, and make informed decisions related to reservoir development and management. It serves as a foundation for more advanced reservoir engineering modules and prepares students for practical applications in the oil and gas industry.			

Module 2

Code	Course/Module Title	ECTS	Semester
PE 312	Drilling engineering I	6	1
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USSWL (hr/w)
3	3	93	57
Description			
Drilling Engineering: The drilling engineering module focuses on the design, planning, and execution of drilling operations to extract oil and gas from underground reservoirs. It covers various aspects of drilling, including well planning, equipment selection, drilling techniques, and wellbore stability. Overall, the drilling engineering module equips students with the knowledge and skills necessary to design, plan, and execute drilling operations effectively and safely. It prepares them to handle the technical and operational challenges encountered in the field of drilling engineering within the petroleum industry.			

Module 3

Code	Course/Module Title	ECTS	Semester
PE 313	Production Engineering I	5	1
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USSWL (hr/w)
3	1	63	62
Description			
The Production Engineering module focuses on the optimization and management of production processes in the oil and gas industry. It covers various techniques and strategies to maximize the efficiency and profitability of producing hydrocarbons from reservoirs. Students gain knowledge and skills in designing, operating, and troubleshooting production systems. The Production Engineering module equips students with the necessary skills to optimize production operations, troubleshoot production challenges, and make informed decisions to maximize hydrocarbon recovery from oil and gas reservoirs.			

Module 4

Code	Course/Module Title	ECTS	Semester
PE 314	Well logging I	4	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/w)
3	1	63	37
Description			
Well logging is a crucial module in petroleum engineering that focuses on the acquisition and interpretation of data from downhole instruments or tools to evaluate subsurface formations. Well logs provide essential information about the geological characteristics, fluid content, and potential hydrocarbon reserves in a well. Throughout the module, students often engage in practical exercises, case studies, and software simulations to gain hands-on experience in interpreting well logs and making informed decisions based on the data. The module aims to equip students with the skills necessary to effectively utilize well logging data for reservoir assessment and management in the petroleum industry.			

Module 5

Code	Course/Module Title	ECTS	Semester
PE 315	Engineering Analysis	4	1
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USSWL (hr/w)
3	1	63	37
Description			
Engineering Analysis: Engineering Analysis is a fundamental module that provides students with the mathematical skills and knowledge necessary for solving engineering problems in the petroleum industry. It covers a range of mathematical concepts and techniques applicable to various engineering disciplines, including petroleum engineering. Engineering Mathematics provides students with a solid foundation in mathematical principles and problem-solving techniques necessary for understanding and analyzing complex engineering problems in petroleum engineering. It forms the basis for more advanced modules in the curriculum and helps students develop the quantitative skills required for various aspects of petroleum engineering, such as reservoir modeling, fluid flow analysis, and optimization of production processes.			

Module 6

Code	Course/Module Title	ECTS	Semester
PE 316	Petroleum Engineering Economics	3	1
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USSWL (hr/w)
2	1	48	27
Description			
Petroleum Engineering Economics is a module within the petroleum engineering department that focuses on the economic analysis and decision-making processes involved in the oil and gas industry. This module combines principles of economics with the technical aspects of petroleum engineering to evaluate the financial viability of exploration, production, and development projects. Petroleum Engineering Economics equips students with the necessary skills to analyze the financial aspects of petroleum projects, evaluate investment opportunities, and make informed decisions in the oil and gas industry. It provides a valuable foundation for professionals involved in project management, investment analysis, and economic planning within the petroleum engineering field.			

Code	Course/Module Title	ECTS	Semester
PE 317	Engineering Statistics	2	1
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	2
Description			
Engineering Statistics is a core module within the petroleum engineering department that introduces students to the fundamental principles of statistical analysis and their applications in solving engineering problems. The course emphasizes data collection, interpretation, and presentation techniques relevant to the oil and gas industry. This module covers descriptive statistics, probability distributions, hypothesis testing, regression analysis, and statistical quality control. Through practical examples and engineering case studies, students learn how to apply statistical tools to analyze operational data, monitor production performance, assess uncertainty in reservoir modeling, and support decision-making in drilling, completion, and production processes.			

Second Semester

Module 1

Code	Course/Module Title	ECTS	Semester
PE 321	Reservoir engineering II	6	2
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USSWL (hr/w)
3	3	93	57
Description			
Reservoir Engineering II is a continuation module that builds on the fundamental principles introduced in Reservoir Engineering I. It focuses on advanced topics related to fluid flow in porous media, reservoir drive mechanisms, material balance analysis, and enhanced oil recovery (EOR) techniques. This course deepens students' understanding of reservoir performance by covering water flooding, gas injection, well testing, reservoir boundary conditions, and pressure maintenance strategies. Emphasis is placed on analytical and semi-analytical methods for evaluating reservoir behavior under various production scenarios. Reservoir Engineering II equips students with the technical competencies to perform complex reservoir analyses, interpret dynamic data, and recommend appropriate development plans. It bridges theory with field application and prepares students for advanced simulation and field management roles in the petroleum industry.			

Module 2

Code	Course/Module Title	ECTS	Semester
PE 322	Drilling engineering II	6	2
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USSWL (hr/w)
3	3	93	57
Description			
Drilling Engineering II is an advanced module that extends the foundational knowledge gained in Drilling Engineering I. It focuses on complex drilling operations, well control techniques, directional and horizontal drilling, offshore drilling practices, and real-time monitoring technologies. The course emphasizes problem-solving in challenging drilling environments, risk assessment, and the integration of safety and environmental considerations. Students are introduced to well control principles, pressure management, kick detection, and blowout prevention systems. Additional focus is given to advanced drilling fluids, casing and cementing strategies, and troubleshooting operational issues. Drilling Engineering II prepares students to tackle advanced technical challenges in both onshore and offshore drilling projects. It enhances their ability to plan and manage efficient, safe, and cost-effective drilling operations, making them well-equipped for engineering roles in modern petroleum exploration and production environments.			

Module 3

Code	Course/Module Title	ECTS	Semester
PE 323	Production engineering II	5	2
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USSWL (hr/w)
3	1	63	62
Description			
Production Engineering II is an advanced module that builds upon the concepts introduced in Production Engineering I, with a focus on specialized techniques and technologies used in well performance optimization, artificial lift systems, surface facility design, and production enhancement methods. The course covers advanced topics such as multiphase flow in pipelines, sand control techniques, well stimulation (acidizing and hydraulic fracturing), and production monitoring systems. Emphasis is placed on diagnosing production issues and implementing practical solutions using modern engineering tools and analysis. Production Engineering II equips students with advanced technical skills to evaluate and enhance well productivity, manage complex production systems, and apply best practices for efficient reservoir depletion. This course prepares students for field-level problem-solving and decision-making roles in the oil and gas production sector.			

Module 4

Code	Course/Module Title	ECTS	Semester
PE 324	Well logging II	4	1
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USSWL (hr/w)
3	1	63	37
Description			
Well Logging II is an advanced module that builds upon the foundational concepts introduced in Well Logging I. It focuses on the in-depth interpretation of complex logging tools and their applications in reservoir evaluation, formation characterization, and production monitoring. The course covers advanced topics such as nuclear magnetic resonance (NMR) logging, formation imaging, dipmeter interpretation, cased-hole logging, and time-lapse (4D) logging. Emphasis is placed on integrating multiple log types to derive accurate petrophysical properties, such as porosity, permeability, saturation, and lithology. Students engage in practical case studies, log interpretation workshops, and software-based analysis to enhance their technical proficiency. Well Logging II equips students with advanced skills for evaluating complex reservoirs and supports informed decision-making in drilling, completion, and reservoir management operations.			

Module 5

Code	Course/Module Title	ECTS	Semester
PE 325	Applied engineering Analysis	4	2
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
3	1	63	37
Description			
The module of Applied Engineering Analysis focuses on providing petroleum engineering students with a strong foundation in Applied Engineering Analysis concepts and techniques that are essential for solving engineering problems in the oil and gas industry. It aims to develop their mathematical skills and their ability to apply mathematical principles to real-world engineering scenarios. The Applied Engineering Analysis module equips petroleum engineering students with the mathematical tools necessary to analyze and solve engineering problems encountered in the field. It provides a solid mathematical foundation that is essential for advanced courses within the petroleum engineering curriculum and for future research or industry work.			

Module 6

Code	Course/Module Title	ECTS	Semester
PE 326	Pollution and industrial safety	2	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	1	33	17
Description			
Pollution and Industrial Safety is a specialized module within the petroleum engineering curriculum that focuses on environmental protection and workplace safety in the oil and gas industry. It addresses the sources, types, and control of industrial pollution, alongside key principles of health, safety, and environmental (HSE) management. The module covers topics such as air and water pollution, hazardous waste management, risk assessment, safety regulations, emergency response planning, and safe handling of petroleum-related chemicals and equipment. Emphasis is placed on international standards and best practices to ensure sustainable operations and compliance with environmental and safety laws. Pollution and Industrial Safety equip students with the knowledge and skills to identify environmental and safety risks, apply preventive measures, and contribute to creating safer, more sustainable petroleum industry operations. It is essential for future engineers involved in facility management, environmental monitoring, and industrial safety planning.			

Module 7

Code	Course/Module Title	ECTS	Semester
PE 327	Geophysics	3	2
Class (hr/w)	Lect/Lab./Prac. /Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1	48	27
Description			
Geophysics is a module within the petroleum engineering department that focuses on the application of physics principles and techniques to study the Earth's subsurface. It plays a crucial role in the exploration and production of oil and gas resources. The Geophysics module provides students with the necessary knowledge and skills to interpret geophysical data, identify potential hydrocarbon reservoirs, and contribute to the overall understanding of subsurface structures. It plays a crucial role in the exploration and development of oil and gas resources, helping petroleum engineers make informed decisions regarding drilling locations, reservoir management, and production optimization.			

Contact

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MODULE DESCRIPTION

وصف المادة الدراسية

1- Level I

First semester

Module 1

Module Information					
معلومات المادة الدراسية					
Module Title	General Geology			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	PE 111				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		1	Semester of Delivery		1
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Riaed Al-saedi		e-mail	dr.ra.iraq@uomisan.edu.iq	
Module Leader's Acad. Title		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		01/06/2025	Version Number		1.0

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



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	This course draws from all fields of geosciences to explore the evolution of Planet Earth. Topics include: an introduction to earth materials (minerals, rocks, soils, and water); Earth's interior structure; geological processes in operation on and beneath the surface of the earth and their effects (weathering, erosion, deformation and geologic structures, earthquakes, plate tectonics).
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This learning outcome implies that upon completing the geology module, students should have achieved the following: 1- Knowledge of Geological Processes: Students should have a solid understanding of the fundamental processes that shape the Earth, such as plate tectonics, erosion, weathering, and deposition. 2- Understanding of Geological Principles: Students should be familiar with key geological principles, including rock formation and identification, geological time, and the interpretation of geological maps and cross-sections. 3- Application of Geology: Students should be able to apply their knowledge of geology to analyze and interpret geological phenomena, such as the formation of mountains, earthquakes, volcanoes, and the distribution of natural resources. They should also be capable to apply knowledge of topographic maps to quantify geometrical aspects of topography. 4- Critical Thinking and Problem-Solving: Students should develop critical thinking skills and be able to apply geological concepts to solve problems and make informed decisions in both academic and real-world contexts. 5- Communication of Geological Concepts: Students should be able to effectively communicate geological concepts, findings, and interpretations using appropriate scientific terminology and conventions, both in written and oral forms.
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Geology, as a scientific discipline, involves the study of the Earth's structure, composition, history, and processes. The learning and teaching strategies employed in geology often focus on a combination of theoretical knowledge, practical fieldwork, laboratory analysis, and interactive discussions. Here are some common learning and teaching strategies used in geology: Laboratory work: Geology involves various laboratory techniques for analyzing rocks, minerals, and other geological materials. Laboratory work provides hands-on experience in using tools and instruments like microscopes, spectrometers, and chemical analysis equipment. Students learn how to identify minerals, analyze rock formations, and interpret geological data through experiments and sample analysis or from geological maps. Visual aids and multimedia: Geology often relies on visual representations to understand complex concepts. The use of diagrams, maps, charts, and models helps students visualize geological processes, landforms, and structural features. Multimedia resources like videos, animations, and virtual reality (VR) simulations can enhance learning by providing interactive and immersive experiences.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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	4	10% (10)	3,5, 10, 13	LO #1, 2, 10 and 11
	Presentation	1	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	10	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Geology The Earth System and Earth materials. The universe and Planet Earth; Earth composition and Earth structure
Week 2	Earth history and geological time, Relative dating; Absolute age
Week 3	Plate tectonic theory, The Type of Plate margins, Consequences of Plate Tectonics
Week 4	Formation and classification of minerals Physical and chemical properties of Minerals. The mineral groups, Mohr's Scale
Week 5	Rock cycle and Types of rocks
Week 6	Igneous rock, Classification of Igneous rock Rocks.
Week 7	Midterm Exam
Week 8	Sediments and Sedimentary Rocks, Classification of Sedimentary Rocks.
Week 9	Metamorphism and Metamorphic Rocks



Week 10	Weathering and Erosion, Mass Wasting
Week 11	Structural geology. Tectonic and deformation; Folding; Faulting
Week 12	Earth energy and resources. Hydrocarbon; Oil shale and coal; Radioactive; Metals and ores; Non-metallic industrial minerals; Renewable energy
Week 13	Project Discussions
Week 14	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Crystallography (symmetry and crystal systems)
Week 2	Lab 2: Physical Properties of Minerals and Mineral Identification
Week 3	Lab 3: Rock Groups and Rock Properties, Rock Identification
Week 4	Lab 4: Igneous rocks (Identification and classification of igneous rocks)
Week 5	Lab 5: Sedimentary rocks (Identification and classification of sedimentary rocks)
Week 6	Lab 6: Geological map (Topography map (Contour Maps), Profiles, and Gradients)
Week 7	Lab 7: Reading and Interpreting Geological Maps: Identification of rock formations, structures, and geological features.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Physical geology, Plumer Carelson, 2020	Yes
Recommended Texts	Edward J. Tarbuck, Frederick K. Latgens (2011), Earth, An Introduction to Physical Geology (10th Edition), Pearson Prentice Hall, USA.	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



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	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 2

Module Information				
معلومات المادة الدراسية				
Module Title	Mathematics 1		Module Delivery	
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	ENG 122			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level		1		
Administering Department		Petroleum Eng.	College	UoM
Module Leader	Sarah Jumah		e-mail	sarajumah@uomisan.edu.iq
Module Leader’s Acad. Title		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		01/06/2025	Version Number	

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	Mathematics I aims to provide a comprehensive introduction to the mathematical concepts and techniques that are fundamental to study electrical engineering. During this course, students will develop a solid mathematical foundation that will support their understanding of advanced electrical engineering topics in subsequent semesters. The main module objectives are: 1. Introduce students to the basic mathematical concepts and notation. 2. Develop proficiency in algebraic manipulations and solving equations. 3. Introduce students to understand the concepts of sets, intervals and



	inequalities. 4. Provide an understanding of analytical geometry. 5. Provide an understanding of trigonometric functions and their applications. 6. Familiarize students with basic concepts of differentiation and the laws of differentiation on various mathematical functions. 7. Familiarize students with basic concepts in linear algebra.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students will be able to: 1. Understand the basic concepts related to this course. 2. Learn the concept of mathematical functions and related mathematical operations. 3. Understand how to represent mathematical functions and equations by drawing. 4. Understand trigonometric functions and their applications. 5. Learn the concept of differentiation and the laws of differentiation on various mathematical functions. 6. Understand how to apply differentiation to various engineering applications in general and applications related to Electrical Engineering in particular. 7. Understand some of the mathematical topics that needed to be understood to enter other courses in the Department of PETROLUME Engineering
Indicative Contents المحتويات الإرشادية	Introduction to calculus: • Equations and solution methods. • Elements and Sets. • Real Numbers and The Real Line. • Interval, Union and Intersections of intervals. • Inequalities. • Analytical Geometry, Distance between Points and Midpoint Formula. • Slope and Equation of Line. • Functions (Sums, Difference, Product and Quotients of Functions). • Domain and Range (Rf) of functions. • Composition of Functions: • Absolute Value Function. • Graph of Functions (Graph of Curves). • Shifting, Shrinking and Stretching of functions. • Trigonometric Functions Derivatives • Definition. • Derivatives by the Limits. • Laws of Derivatives. • Second and Higher Order Derivative. • Implicit Differentiation. • The quotient rule for Derivative. • The Chain Rule. • Derivative of Parametric Equations. • Derivative of Trigonometric Functions. • Applications of Derivatives. Matrices • Introduction to Matrices: Definition and notation of matrices, matrix elements, size or dimensions of a matrix, special types of matrices (square,



	rectangular, row vector, column vector), equality of matrices. • Matrix Operations: Addition and subtraction of matrices, scalar multiplication, matrix multiplication. • Matrix determinant. • Matrix Inverses. • Matrix transpose. • Systems of Linear Equations. • Cramer's rule. Limits and Continuity • Introduction. • Definition. • Properties of the Limits. • Right-hand limits and left-hand limits. • Limit Involving Infinity. • Continuous Function. • Algebraic properties of continuous functions.
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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 in solving problems. This will be achieved through classes, interactive tutorials, home works and quizzes.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		



Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	3,7, 10,13	LO #1, 2, 10 and 11
	Classwork	2	10% (10)	5, 11	LO # 3, 4, 6 and 7
	Assignments	2	10% (10)	6, 14	LO # 3, 4, 6 and 7
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to calculus, Equations and solution methods, Elements and Sets, Real Numbers and The Real Line, Interval, Union and Intersections of Intervals, and Inequalities.
Week 2	Analytical Geometry: Distance between points, Slope and equation of Line, Point Slope Equation, The Distance from Point to a Line, and Angles between two Lines.
Week 3	Assignment + Quiz + Functions: Definition, Domain and Range of Functions, Absolute Value Function, The Greatest Integer Function, and Composition of Functions.
Week 4	Graph of Functions: Symmetry Test for Graphs, Shifting, Shrinking and Stretching.
Week 5	Assignment + Trigonometric Functions: Definition and Identities of Trigonometric Functions, Graph of Trigonometric Functions.
Week 6	Quiz + Derivatives: Definition, Derivatives by the Limits, Laws of Derivatives, and Second and Higher Order Derivative
Week 7	Implicit Differentiation and the Quotient rule for Derivatives.
Week 8	The Chain Rule, Derivative of Parametric Equations, and Derivative of Trigonometric Functions.
Week 9	Assignment + Quiz + Applications of Derivatives, Analysis of Functions: Increase and Decrease, Concavity and Inflection Points, Horizontal and Vertical Asymptotes, and Oblique Asymptotes
Week 10	Mid Term + Matrices: Introduction to Matrices: Definition and notation of matrices, matrix elements, dimensions of a matrix, special types of matrices (square, rectangular, row vector, column vector)
Week 11	Matrices: equality of matrices, Matrix Operations: Addition and subtraction of matrices, scalar multiplication, matrix multiplication, Matrix determinant, Matrix Inverses, Matrix transpose.



Week 12	Assignment + Matrices: Systems of Linear Equations and Cramer's rule.
Week 13	Quiz + Limits and Continuity: Introduction, Definition, and Properties of the Limits.
Week 14	Right-hand limits and left-hand limits, Limit Involving Infinity, Continuous Function, and Algebraic properties of continuous functions.
Week 15	Review and solve related problems.
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Thomas, G. B., Weir, M. D., Hass, J., Giordano, F. R., & Korkmaz, R. (2010). <i>Thomas' calculus</i> (Vol. 12). Boston: Pearson.	Yes
Recommended Texts	Thomas, G. B., Weir, M. D., Hass, J., Giordano, F. R., & Korkmaz, R. (2010). <i>Thomas' calculus</i> (Vol. 12). Boston: Pearson.	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.				



Module 3

Module Information				
معلومات المادة الدراسية				
Module Title	Computer I		Module Delivery	
Module Type	Basic		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	UOM 122			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level				
Administering Department		Petroleum Eng.	College	UoM
Module Leader	Ali Dhahir Mohsin		e-mail	alidh11@uomisan.edu.iq
Module Leader's Acad. Title		Asst. Professor	Module Leader's Qualification	
Module Tutor	Nsaif Jasim Hadi		e-mail	nsf_jsm@uomisan.edu.iq
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date		01/06/2025	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	١. تعريف الطالب بكيفية استخدام الحاسوب من خلال تعريفه على نظام التشغيل والبرامج الخدمية التي سوف تساعد في دراسته مثل برامج الأوفيس (word 2010 , excel 2010) ٢. التعرف على البرنامج المستخدم لكتابة الاكواد والواجهات بلغة الفجول بيسك والتعرف على اساسيات اللغة وكيفية كتابة الجمل الشرطية وانواع الاوامر لتنفيذها التعرف على العمليات التكرارية واهم الاوامر المستخدمة في التكرار.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	١- قدرة الطالب على التعامل مع الحاسب الالى وإدارة الملفات والمجلدات ٢- تعلم لغة برمجة مرئية مرنة تلبي الغرض الأساسي لكتابة البرامج التي تساعد الطالب في فهم اساسيات البرمجة وإمكانية التحليل ويتم ذلك من خلال التالي: أ- تنصيب برنامج الفجول بيسك ب- معرفة الاساسيات وكيفية استدعاء المتغيرات ونوع البيانات التي يتم ادراجها ت- معرفة استخدام الجمل الشرطية وتطبيق البرامج الخاصة بها ث- معرفة كيفية تكرار تنفيذ الايعازات المتعددة والاوامر المستخدمة في التكرار ج- التعرف على بعض الايعازات ذات استخدام محدد لتنفيذ امر ح- التعرف على المكتبات المستخدمة والغرض من استدعاءها خ- التعرف على كيفية تنفيذ العمليات المنطقية والرياضية
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	الطريقة الألقائية الطريقة الحوارية الطريقة الناشطة (تعتمد على نشاط الطالب)
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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	12	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.5
Total SWL (h/sem)	75		



الحمل الدراسي الكلي للطلاب خلال الفصل					
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
	classwork	2	10% (10)	4, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	4	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Computer basics \$ Computer's components
Week 2	Operating System (windows 10)
Week 3	Application software (Microsoft Office)
Week 4	MS word 1
Week 5	MS word2
Week 6	Excel 1
Week 7	Excel 2
Week 8	Install program of VB Basic
Week 9	study most of VB Basic components
Week 10	Arithmetic and logic operations & Input / Output program
Week 11	Public and private variables
Week 12	If condition & Nested if
Week 13	Loops (for) , Loops (while) & Nested loops
Week 14	Preparatory week before the final Exam



Week 15	the final Exam
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Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	Computer basics \$ Computer's components
Week 2	Operating System (windows 10)
Week 3	Application software (Microsoft Office)
Week 4	MS word 1
Week 5	MS word2
Week 6	Excel 1
Week 7	Excel2
Week 8	Install program of VB Basic
Week 9	study most of VB Basic components
Week 10	Arithmetic and logic operations & Input/Output program
Week 11	Public and private variables
Week 12	If condition & Nested if
Week 13	Loops (for)
Week 14	Loops (while) & Nested loops
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts		
Recommended Texts	https://codebun.com/visual-basic-programs-for-beginners-with-examples/	No
Websites	يمكن الولوج الى صفحة الموضوع او من خلال موقع الكلية: www.uomisan.edu.iq/moodle or Getting started with VBA in Office Microsoft Learn	



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 4

Module Information					
معلومات المادة الدراسية					
Module Title	Engineering Mechanics			Module Delivery	
Module Type	Basic			☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	PE 112				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1	Semester of Delivery			
Administering Department		Petroleum Eng.	College	UoM	
Module Leader	Hussein Midhe		e-mail	hussainbahadly8@uomisan.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		01/06/2025	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 aims of Engineering Mechanics are to provide a fundamental understanding of the principles and laws governing the behavior of physical systems, with a focus on mechanical systems. This discipline is essential for engineers as it lays the foundation for analyzing and solving problems related to the design, operation, and maintenance of structures and machines. The specific module aims of Engineering Mechanics may vary depending on the educational institution and the level of study. However, here are some common aims that are typically covered in Engineering Mechanics courses:



	Overall, the module aims to equip students with a solid foundation in mechanics, enabling them to analyze and design mechanical systems and structures, and providing a basis for further study in engineering disciplines such as civil, mechanical, and aerospace engineering.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The specific learning outcomes of an Engineering Mechanics module may vary depending on the educational institution and the level of study. However, here are some common learning outcomes that are typically associated with Engineering Mechanics courses: Knowledge and understanding of fundamental principles: Students should demonstrate a solid understanding of the fundamental principles of mechanics, including Newton's laws of motion, equilibrium conditions, conservation of energy and momentum, and their application to mechanical systems. Problem-solving skills: Students should be able to apply the principles of mechanics to solve engineering problems. They should demonstrate the ability to analyze and model the behavior of mechanical systems, calculate forces, moments, and stresses, and apply appropriate equations and formulas to solve problems. Effective communication and teamwork: Students should be able to communicate their ideas, analysis, and solutions effectively, both in written and verbal forms. They should also be able to work collaboratively in teams, demonstrating effective teamwork and the ability to contribute to group discussions and projects. These learning outcomes aim to provide students with a solid foundation in Engineering Mechanics, preparing them for further study or professional practice in engineering disciplines that require a strong understanding of mechanics, such as civil engineering, mechanical engineering, aerospace engineering, and more.
Indicative Contents المحتويات الإرشادية	Introduction to Engineering Mechanics: Overview of mechanics and its importance in engineering, Fundamental concepts and definitions, Units and dimensions, Scalars and Vectors: Differentiation between scalar and vector quantities, Vector operations, such as addition, subtraction, and multiplication, Components and coordinate systems, Force Systems and Equilibrium: Types of forces (e.g., gravitational, applied, frictional) Resultant and equilibrium conditions Free-body diagrams and analysis of forces Newton's Laws of Motion: Newton's three laws of motion and their applications Force and acceleration Application of Newton's laws to solve problems Applications of Newton's Laws: Motion of particles in one and two dimensions Projectile motion Circular motion and centripetal force Work, Energy, and Power: Work done by forces Kinetic and potential energy Conservation of mechanical energy Power and efficiency Impulse and Momentum: Linear momentum and its conservation Impulse-momentum theorem Collisions and impact Statics of Rigid Bodies: Equilibrium conditions for rigid bodies Analysis of trusses, frames, and machines Distributed forces and centroids Friction and its effects Kinematics of Rigid Bodies: Translation, rotation, and general plane motion Angular velocity and acceleration Relative motion analysis



	Dynamics of Rigid Bodies: Moment of inertia and its properties Equations of motion for rotating bodies Torque and angular momentum Structural Analysis: Analysis of simple structures (e.g., beams, columns) Axial loading, bending moments, and shear forces Stress and strain analysis Applications to Engineering Problems: Application of Engineering Mechanics principles to real-world engineering problems Case studies and examples from various engineering disciplines Design considerations and optimization These topics provide a comprehensive overview of Engineering Mechanics, covering the fundamental principles and their applications to various mechanical systems and structures. The actual contents and depth of coverage may vary, and additional topics may be included based on the specific requirements of the curriculum and the level of study.
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Lectures: Lectures are a common teaching method used to deliver key concepts and theoretical foundations of Engineering Mechanics. In lectures, instructors present the material using visual aids, demonstrations, and examples. This allows students to gain a theoretical understanding of the subject matter. Tutorials and Problem-solving Sessions: Tutorials and problem-solving sessions provide students with opportunities to apply the principles and concepts learned in lectures to solve engineering problems. In these sessions, students work through practice problems individually or in groups, guided by the instructor. This helps reinforce understanding, develop problem-solving skills, and clarify any misconceptions. Laboratory Sessions: Laboratory sessions provide hands-on experience with physical experiments or computer simulations related to Engineering Mechanics. These sessions allow students to observe and measure physical phenomena, validate theoretical concepts, and develop practical skills in data collection and analysis. Lab sessions may also involve the use of software tools for modeling and simulation. Interactive Discussions: Interactive discussions, such as seminars or group discussions, encourage active participation and critical thinking among students. Instructors may present case studies, real-world examples, or challenging problems to stimulate discussion and promote deeper understanding of Engineering Mechanics principles. This strategy also allows students to share their perspectives, ask questions, and engage in collaborative learning. Computer-Aided Learning: Computer-aided learning tools, such as online tutorials, interactive simulations, or virtual laboratories, can enhance understanding and provide additional resources for students. These tools enable students to explore concepts, visualize complex phenomena, and engage in self-paced learning. Design and Project Work: Design projects or assignments related to Engineering Mechanics provide opportunities for students to apply their knowledge and skills to practical engineering problems. Students may be tasked with analyzing and designing structures, evaluating mechanical systems, or optimizing designs based on given constraints. These projects enhance critical thinking, problem-solving abilities, and teamwork. Formative Assessments: Formative assessments, such as quizzes, in-class exercises, or online assessments, are used to provide feedback and monitor students' progress throughout the
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module. These assessments help identify areas where students may need additional support or clarification, allowing instructors to adjust their teaching methods accordingly.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Classwork	2	10% (10)	4,13	LO # 3, 4, 6 and 7
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Force system: (force, moment, couple, resultant of forces)
Week 2	Equilibrium: (Conditions of Equilibrium, Free Body Diagram, Two and Three Force Member)
Week 3	Friction: (Characteristics of Friction, Types of Friction and Application of Friction).
Week 4	Center of Gravity and Centroid: (Center of Mass and Body, Centroids of Lines, Area and Volume, Composite Bodies and Figures).



Week 5	Moments of Inertia: (Definition of Moments of Inertia for Area, Moments of Inertia for Composite Areas and Moments of Inertia for an Area about Inclined Axes).
Week 6	(Newton's Laws: (First, Second and third Law)
Week 7	Mid-term Exam
Week 8	Friction: (Characteristics of Friction, Types of Friction and Application of Friction).
Week 9	Center of Gravity and Centroid: (Center of Mass and Body, Centroids of Lines, Area and Volume, Composite Bodies and Figures).
Week 10	Moments of Inertia: (Definition of Moments of Inertia for Area, Moments of Inertia for Composite Areas and Moments of Inertia for an Area about Inclined Axes).
Week 11	Kinetic of Particle: (Force, Mass and acceleration).
Week 12	Kinetic of Particle: (Force, Mass and acceleration).
Week 13	Kinematic of Particle: (Rectilinear Motion, Curvilinear Motion)
Week 14	Kinetic of Particle: (Force, Mass and acceleration).
Week 15	Kinetic of Particle: (Work and Energy and Rotation).

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Meriam, J.L. and Kraige, L.G. 2002., Engineering Mechanics Statics, Fifth Edition, John Wiley & Sons Inc.	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



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



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 5

Module Information					
معلومات المادة الدراسية					
Module Title	Democracy and human rights		Module Delivery		
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	UOM 121				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		1	Semester of Delivery		1
Administering Department		Petroleum Eng.	College	UoM	
Module Leader	Muayad Kareem Hassan		e-mail	muayad.k.hassan@uomisan.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		Master
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		01/06/2025	Version Number		

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 gain an understanding of the philosophic and political backgrounds that underpin the concept of human rights, enabling students to grasp the multifaceted nature of this complex field. 2-To learn about the significant historical documents that have contributed to the development and formation of human rights theories, enriching their knowledge of the history and evolution of human rights.



	3-To engage in critical examination and discussion of current political and ethical debates surrounding human rights, fostering critical thinking and encouraging students to form their own perspectives on these issues. 4-To study key legal documents and understand the work of crucial governmental and non-governmental institutions currently involved in the protection and promotion of human rights. This objective aims to make students aware of the global landscape of human rights protection and how it operates. 5-To undertake a detailed examination of at least one current problem area in human rights protection, providing a practical application of knowledge and giving students a deeper understanding of the complexities and challenges faced in human rights protection. 6-To promote an understanding and appreciation of the importance of human rights in all areas of life, including engineering, highlighting the significance of ethical considerations in technical professions. 7-To encourage students to consider how their future work as engineers could potentially impact human rights, fostering a sense of social responsibility and ethical awareness in their professional practice. 8-To cultivate skills in research, analysis, and argumentation related to human rights, thereby enhancing students' overall academic and intellectual skills.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand the historical, philosophical, and political context of human rights, appreciating the complexities and dimensions of the concept. 2- Be familiar with significant historical documents and milestones that have contributed to the evolution of human rights theories and their role in shaping the current understanding of human rights. 3- Analyze and articulate positions on contemporary political and ethical debates about human rights, demonstrating critical thinking skills and a broad understanding of the issues. 4- Identify and understand the roles of major governmental and nongovernmental institutions in the promotion and protection of human rights, demonstrating an awareness of the broader global landscape of human rights advocacy. 5- Analyze a specific, current problem area in human rights protection, applying theoretical knowledge to real-world situations and demonstrating problem-solving skills. 6- Appreciate the relevance and importance of human rights considerations within their field of study, electrical engineering, and the broader engineering context. 7- Exhibit an understanding of the ethical responsibilities and potential impacts of engineering projects on human rights, preparing them to consider these factors in their future professional practice.



	8- Show competence in researching, analyzing, and articulating arguments related to human rights, demonstrating development in academic skills applicable beyond this specific module. By achieving these learning outcomes, students will have not only a strong foundational understanding of human rights and its relevance to their discipline but also enhanced critical thinking and problem-solving skills.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Introduces students to the philosophic and political background of the concept of human rights. 2. Discusses important documents as part of the history of the development of human rights theories. 3. Examines important issues in current political and ethical debates about human rights. 4. Reviews core legal documents and the work of the most important governmental and nongovernmental institutions currently involved in human rights protection and promotion. 5. Examines at least one current problem area in human rights protection

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures: Traditional lectures will be used to introduce fundamental concepts, providing students with a strong theoretical foundation in the philosophic and political backgrounds of human rights, the history of human rights theories, and the role of various institutions in human rights protection and promotion. 2. Interactive Discussions: To facilitate critical thinking and engagement, class sessions will often involve interactive discussions. These might revolve around the analysis of important historical documents, current debates on human rights issues, or case studies of specific problem areas in human rights protection. 3. Group Projects: Students will work in groups to analyze a specific problem in human rights protection, encouraging teamwork, fostering a deeper understanding of the issue, and enabling students to apply theoretical knowledge to practical scenarios. 4. Guest Lectures: Inviting practitioners from the field, such as human rights activists, legal professionals, or engineers working on ethical issues, can provide students with real-world insights and inspire them to consider the impact of their work on human rights.



	5. Research Assignments: Individual or group assignments might require students to conduct research on a specific topic related to human rights. This encourages independent learning, develops research skills, and deepens their understanding of the subject.
	6. Case Studies: By analyzing and discussing real-world cases in class, students can understand the practical application of human rights theories, grasp the challenges faced in human rights protection, and consider the relevance of these issues in their own field of study.
	7. Online Resources: Making use of online resources, such as academic articles, video lectures, podcasts, or documentaries, can supplement the course material and offer different perspectives on the subject matter.
	8. Reflection Papers: Students could write reflection papers on how they see human rights intersecting with their engineering studies and future careers, promoting introspection and ethical awareness.
	These strategies aim to promote an active learning environment where students can deeply engage with the subject matter, enhancing their understanding and fostering important skills such as critical thinking, teamwork, research, and communication.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
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	10% (10)	3,5, 7,10,13	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	presentation	1	10% (10)	9	LO # 3, 4, 6 and 7
	Report	1	10% (10)	13	LO # 5, 8 and 10



Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	مدخل عام الى مفهوم حقوق الانسان
Week 2	حقوق الانسان في الحضارات القديمة والشرائع السماوية
Week 3	تطور فكرة حماية حقوق الانسان في العصر الحديث
Week 4	المجتمع الدولي وحقوق الانسان
Week 5	اليات الامم المتحدة لحماية حقوق الانسان
Week 6	واجبات الانسان والقيود الواردة على ممارسة حقوق الانسان
Week 7	المنظمات والهيئات الدولية المعنية بحماية حقوق الانسان
Week 8	اخلاقيات المهنة تعليمات انضباط الطلبة في مؤسسات التعليم العالي رقم ١٦٠ لسنة ٢٠٠٧
Week 9	مفهوم وتاريخ الديمقراطية
Week 10	سمات النظام الديمقراطي ومكوناته
Week 11	الدستور والديمقراطية
Week 12	العلاقة بين حقوق الانسان والديمقراطية
Week 13	ضمانات الحريات والحقوق العامة
Week 14	الديمقراطية المعاصرة و شروط قيام الديمقراطية الدستورية
Week 15	the Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	حقوق الانسان والديمقراطية: ا.م.د غسان كريم مجذاب و ا.م.د امجد زين العابدين , ٢٠٢١	
Recommended Texts	حقوق الانسان والديمقراطية: ا.م.د غسان كريم مجذاب و ا.م.د امجد زين العابدين , ٢٠٢١	
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 6

Module Information					
معلومات المادة الدراسية					
Module Title	Strength of Materials		Module Delivery		
Module Type	BASIC		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	PE 113				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		1	Semester of Delivery		1
Administering Department		Petroleum Eng.	College	UoM	
Module Leader	Wameedh Issa Braidi		e-mail	wameedhiss@uomisan.edu.iq	
Module Leader's Acad. Title		Assist. Lec.	Module Leader's Qualification		Master
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		01/06/2025	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	• As the engineering design of different components, structures etc. used in practice are done using different kinds of materials, it is essential to understand the basic behavior of such materials
Module Learning Outcomes	Lectures series on Strength of Materials are prepared, explaining the fundamentals in a simple and lucid manner so that the students can grasp the basics of the application of loading system and its consequence in a deformable body.
Indicative Contents	



المحتويات الإرشادية

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.
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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	62	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.	8	16% (16)	2, 12	LO # 3, 4, 6 and 7
	Report	1	4% (4)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Introduction to strength of materials • Introduction—Concept of Simple Stress and Strain • Axial Loading; Normal Stress • Shearing Stress • Bearing Stress
Week 2	• Stress and Strain—Axial Loading • Tensile test • Stress-Strain Diagram • True Stress and True Strain
Week 3	• Hooke's Law; Modulus of Elasticity • Deformations of Members under Axial Loading • Plastic Deformations • Elastic versus Plastic Behavior of a Material
Week 4	• Poisson's Ratio • Longitudinal strain • Lateral strain • Application of Poisson's ratio to a two-dimensional stress system
Week 5	• Shear stress • Shear strain • Modulus of rigidity • Thermal Stress
Week 6	• Thin Cylinders and Shells • Thin cylinders under internal pressure • Hoop or circumferential stress • Longitudinal stress • Changes in dimensions
Week 7	• Thin spherical shell under internal pressure • Change in internal volume
Week 8	• Torsion • Simple torsion theory • The Angle Of Twist • Shear Stress And Shear Strain In Shafts • The Maximum Shear Stress
Week 9	• Series connection of the shafts • Parallel Connection Of The Shafts • Power Transmitted By Shafts
Week 10	• Helical Springs • Spring deformation • SPRINGS IN SERIES • Spring in parallel
Week 11	• Flanged bolt



Week 12	- Slope and deflection of beams - Buckling
Week 13	Bending theory and second moment of area
Week 14	- Final Project and Exam Preparation - Exam preparation and review
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Tensile Test
Week 2	Lab 2: Compression Test
Week 3	Lab 3: Shear Test
Week 4	Lab 4: Impact Test
Week 5	Lab 5: Hardness Test
Week 6	Lab 6: Torsion Test
Week 7	Lab 7; bending test
Week 8	Lab 13: Review
Week 9	Lab 14: Examination
Week 10	Lab 15: Final examination

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Strength of Materials 3rd Edition. - Mechanics of Materials, Ninth Edition, 2014, Published by Pearson Prentice Hall R.C. Hibbeler	Yes
Recommended Texts	- Mechanics of Materials, Seventh Edition, 2015 Published by McGraw-Hill Education - Ferdinand P. Beer E. Russell Johnston, Jr. - John T. DeWolf	No



	David F. Mazurek	
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.				



Module 7

Module Information					
معلومات المادة الدراسية					
Module Title	Engineering Workshop		Module Delivery		
Module Type	Basic		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	ENG 123				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	١	Semester of Delivery			١
Administering Department		Petroleum Eng.	College	UoM	
Module Leader	Mushtaq Abass Al-Furaiji		e-mail	eng.mushtaq@uomisan.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		01/06/2025	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	To introduce basic workshop practices, production, labor, and time requirements of workshop operations.
Module Learning Outcomes	This course is essential in all engineering branches providing the students with the general basics of engineering science. by completing this course, students will be able: - 1- To understand how the world, both natural and man-made, works.



مخرجات التعلم للمادة الدراسية	2-To have a good knowledge of safety rules on-site in an industrial environment and increase the knowledge about the use of working tools, instruments, and machines. 3-To present a general guide for solving problems. 4-To introduce the concept of free body diagram and equilibrium equation.
Indicative Contents المحتويات الإرشادية	Workshop Skills The students are introduced to training programs in four workshops: welding, turning, carpentry, and casting.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Maintain the ray of hope for the weak individuals through the stable opportunity to override failure. Motivate the spirit of competition between the students
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	2	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	0.5
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	3	30% (30)	5, 10	LO #1, 2, 10 and 11
	Assignments	4	20% (20)	2, 12	LO # 3, 4, 6 and 7
	Projects	5	20% (20)	Continuous	All
	Report	1	20% (20)	13	LO # 5, 8 and 10
	Midterm Exam	1 hr	10% (10)	7	LO # 1-7



Summative assessment					
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	CARPENTRY: Carpentry Tools, Cutting Tools, Planes
Week 2	Boring Tools, Jigsaw, Power planes, Circular saw, Router Cutters, Orbital Sander
Week 3	FITTING: Holding Tools, Striking Tools, Cutting Tools
Week 4	Measuring, Marking and Testing Tools, Impact Driver, Chain Saw, Angle Grinder
Week 5	Drilling Machine, Nail Gun, Impact Wrench, Cut off Machine + Quiz
Week 6	WELDING Arc welding equipment
Week 7	Gas welding: Oxy acetylene welding equipment + Quiz
Week 8	Soldering equipment, Brazing equipment Structure Item: Indirect Questions
Week 9	TURNING: Turning machine (lathe)
Week 10	Cutting machine + Quiz
Week 11	Drilling machine
Week 12	Milling machine
Week 13	CASTING: Furnaces
Week 14	Sand Casting, Molding box, Cores, Casting inspection equipment
Week 15	FORGEABILITY: Anvil, Forging Hand Tools, Hammers, Tongs, Hearth, Swage, block Exam preparation and review
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Carpentry Workshop: Introduction to workshop safety, identification and practical use of carpentry hand tools, measuring tools, cutting tools, planes, and preparation of a simple wooden joint.
Week 2	Carpentry Machines and Power Tools: Practical use and demonstration of drilling tools, jigsaw, circular saw, power plane, router, and orbital sander, with emphasis on safe operating procedures.



Week 3	Fitting Workshop: Identification and practical use of holding, striking, cutting, measuring, marking, and testing tools; preparation of a simple metal fitting exercise.
Week 4	Drilling and Mechanical Power Tools: Practical operation of drilling machine, impact driver, angle grinder, cut-off machine, nail gun, and impact wrench, including safety precautions and basic maintenance.
Week 5	Welding Workshop: Arc welding equipment, electrode selection, machine setup, safety procedures, and practical execution of basic arc welding joints.
Week 6	Gas Welding, Brazing, and Soldering: Identification and setup of oxy-acetylene welding equipment; practical exercises in gas welding, brazing, and soldering.
Week 7	Machine Tools and Manufacturing Processes: Practical demonstration of lathe, milling, and drilling machines, followed by an introduction to sand casting, molding boxes, cores, furnaces, and basic forging tools.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Hajra Choudhury, S. K., Hajra Choudhury, A. K., & Nirjhar Roy – <i>Elements of Workshop Technology</i> , Vol. I & II	Yes
Recommended Texts	W. A. J. Chapman – <i>Workshop Technology, Part 1, 2 & 3</i>	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



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



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 8

Module Information					
معلومات المادة الدراسية					
Module Title	Arabic Language 1			Module Delivery	
Module Type	Basic			☐ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	UOM 123				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	1	Semester of Delivery			
Administering Department		Petroleum Eng.	College	UoM	
Module Leader	Mohammed Abdhussain Mohammed		e-mail	moh.albahadli@uomisan.edu.iq	
Module Leader's Acad. Title		Assist. Lec.	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		01/06/2025	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	ان الهدف من تدريس مادة اللغة العربية في هذا القسم هو الكفاءة اللغوية للطلبة وتمكينهم من التعبير عن أفكارهم ومشاريعهم بلغة عربية فصيحة واضحة خالية من الغلط واللون العامي والاعجمي بأبسط الطرق. فاللغة هي أداة الاتصال الأولى بين أفراد المجتمع، ومتى تمكن الإنسان من لغته استطاع الوصول الى أذهان الآخرين بحيث يسهل تعامله معهم ويتمكن من تحقيق هدفه في العمل.



	وان ذلك يؤدي الى تحقيق التوازن المفترض في ثقافة الطلبة فهو يضمن نوعاً من التعادل بين مناهج المادة العلمية ووسيلة إيصالها او التعبير عنها.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	أ- الاهداف المعرفية ١- يتعلم الطالب خلال الفصل الدراسي بعض اساسيات مادة اللغة العربية. ٢- فهم تاريخ واساسيات نشأ قواعد اللغة العربية. ٣- يتعلم كيفية كتابة تقرير او بحث او طلب اجازة بدون اخطاء لغوية او كتابية . ٤- يتعلم الطالب كيفية كتابة الانشاء ومنها الى طريقة كتابة التقارير والبحوث العلمية. ب- الاهداف المهاراتية الخاصة بالموضوع: جعل الطالب قادرا على ان: ب ١ - يتعلم كيفية كتابة انواع الهمزة سواء كانت همزة قطع او وصل وكيفية لفظها . ب ٢ - يتعلم نبذة عن كتابة الهمزة سواء على الالف او الياء او الواو او مفردة على السطر. ب ٣ - يفرق بين الظاء والضاد. ب ٤ - يفرق بين التاء المربوطة والتاء.
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	١- تمكين الطلبة من كتابة التقارير حول المواضيع الخاصة بجميع المواد وصياغتها بعيدا عن الاخطاء اللغوية. ٢- تمكين الطلبة من كيفية استخدام المفردات الصحيحة وذلك من خلال الرجوع للقواميس. ٣- رفع ثقة الطالب بنفسه من خلال خوض بعض المحادثات والمناظرات اللغوية ولا سيما الشعرية منها. ٤- تنمية مهارات الطلبة في كيفية التعامل مع مشاكل اللغة على الصعيدين اللفظي والكتابي وكيفية التعامل معها .

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50		



Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	3,5, 10, 13	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	classwork	1	10% (10)	6	LO # 3, 4, 6 and 7
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	قواعد اللغة العربية: الكلام وما يتألف منه: الاسم، والفعل والحرف الفعل واقسامه، علاماته، الفعل الماضي قواعد فعل الأمر، الحرف وما يتميز به
Week 2	الفعل واقسامه، علاماته، الفعل الماضي قواعد فعل الأمر، الحرف وما يتميز به
Week 3	قواعد فعل الأمر، الحرف وما يتميز به
Week 4	الأعراب والبناء، وعلامات الأعراب، والمثنى والملحق به
Week 5	ادب، ونص شعري، ودراسة وتحليل جمع المذكر السالم / والملحق به
Week 6	الملحقة بالأسماء الستة
Week 7	امتحان نصف الفصل
Week 8	المبتدأ والخبر، انواع المبتدأ واحكامه
Week 9	قواعد: الخبر، تعريفه وانواعه اختبار يومي
Week 10	أملاء: قواعد كتابه الهمزة
Week 11	ادب: نص نثري. دراسة وتحليل
Week 12	قواعد: اغلاط لغوية شائعة
Week 13	أملاء: قواعد كتابه الألف في نهاية الكلمة
Week 14	محاضرة عامه ومناقشات
Week 15	Preparatory week before the final Exam



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	شرح ابن عقيل على الفية ابن مالك. بيروت دار الكتب العامة ١٩٨٥ ، تحقيق محي الدين عبد الحميد	Yes
Recommended Texts	جامع الدروس العربية. بيروت دار الكتب العلمية ١٩٨٤. ١٩٨٧ ، تأليف مصطفى - الغلايني - اللغة العربية لغير أقسام الاختصاص. مؤسسه دار الكتب بغداد ١٩٨١ ، تأليف عبد القادر حسين أمين. والدكتور رشيد العبيدي	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
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	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.



1- Level I

Second Semester

Module 1

Module Information					
معلومات المادة الدراسية					
Module Title	Sedimentology and Stratigraphy		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☐ Seminar		
Module Code	PE 121				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		1			Semester of Delivery
Administering Department		Type Dept. PE	College	Engineering College	
Module Leader	Riaed Al Siaede		e-mail	dr.ra.iraq@uomisan.edu.iq	
Module Leader's Acad. Title		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		01/06/2025	Version Number		1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	2
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	teaching and applying the principle of historical geology and the relative age of geological events and the relation between these events and the accumulation of petroleum. Also, the distribution of sedimentary environments and the petrophysical properties of each sedimentary basin were explained.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The student will understand the depositional environments and the historical events which controlled the distribution of oil fields, and how can used this knowledge to explore new oil traps and analysis the quality of reservoir rocks.



Indicative Contents المحتويات الإرشادية	Maps, Figures and movies.
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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	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	73	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10 % (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	6	12% (12)	Continuous	All
	Report	1	8% (8)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Define the stratigraphy. The methods for rock age measurements The relative and absolute age determination methods.
Week 2	The main geological principles. Find relative age of geological formations by geological principles.
Week 3	Geological time scale
Week 4	The depositional environments Continental environments.
Week 5	Transitional depositional environment
Week 6	Marine depositional environment.
Week 7	Marine depositional environment.
Week 8	The relation between plate tectonic and depositional environment
Week 9	The designation of rock units The Formation, Member and Group.
Week 10	The Geological succession of Iraq oil fields.
Week 11	The classification of main sedimentary rock groups
Week 12	Terrigenous rocks Classification Texture. Sorting, roundness. Maturity.
Week 13	Carbonate rock depositional environment and classification.
Week 14	Examples about sedimentary environments.
Week 15	Project Discussions, Preparatory week before the final Exam
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: geological time scale principals
Week 2	Lab 2: relative age measuring
Week 3	Lab 3: transgression and regression
Week 4	Lab 4: thin section classification



Week 5	Lab 5: the development of depositional environment
Week 6	Lab 6: Facies maps
Week 7	Lab 7: analysis facies maps.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Physical geology, Plumer Carelson, 2020	Yes
Recommended Texts	Principles of Sedimentology and Stratigraphy (4th Edition), Boggs, 2005.	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.



Module 2

Module Information					
معلومات المادة الدراسية					
Module Title	Mathematics 2			Module Delivery	
Module Type	Basic			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ENG 124				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level			1		
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Sara Juma			e-mail	sarajumah@uomisan.edu.iq
Module Leader's Acad. Title		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		01/06/2025	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Mathematics 1 (ENG 122)	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	Mathematics II aims to introduce students to the concept of integration and its importance to electrical engineering. Students will learn various integration methods, applications of definite integrals, and numerical integration. In addition to that, transcendental functions, complex numbers and polar coordinates will be covered in Mathematics II. The module objectives can be concluded as follow: 1. Introduce students to understand the concept of integration and how to solve related problems. 2. Identify different integration techniques and use them correctly to find the integrals of different functions. 3. Understand the effective methods of using integrals in problems related to electrical engineering applications.



	4. Understand how to deal with complex numbers and use it with all associated mathematical operations 5. Familiarize students with the concepts of polar coordinates.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students will be able to: 1. Understand the concept of integration and its importance in engineering applications. 2. Demonstrate proficiency in performing basic integration operations. 3. Apply integration techniques, including substitution, integration by parts, partial fractions, and trigonometric substitutions, to solve a variety of engineering problems. 4. Analyze and interpret the geometric and physical significance of definite integrals in the context of electrical engineering, such as computing areas and volumes. 5. Utilize numerical integration techniques, such as the trapezoidal rule and Simpson's rule, to approximate definite integrals in practical scenarios. 6. Perform arithmetic operations with complex numbers and find complex conjugates. 7. Convert equations between rectangular and polar forms.
Indicative Contents المحتويات الإرشادية	Indefinite Integrals • Rules for indefinite integrals • Integration of trigonometric functions • Solving Initial Value Problems with Indefinite Integrals • Definite Integrals • Rules for Definite Integrals Techniques of Integration • Basic Integration Formulas (by Substitution) • Integration by Parts • Tabular integration. • Trigonometric Integrals • Definite integrals of odd and even functions • Integration by Trigonometric Substitutions • Integrating Rational Functions by Partial Fractions • Integration by substitution • Numerical integration (The Trapezoidal Rule and Simpson Rule) Application of Integrals: • Area under a curve • Finding the area between two curves • Volume of solids of revolution • Length of curves Transcendental Functions: • Inverse functions • Logarithmic functions Complex Numbers: • Complex numbers and operations • Graphical representation of complex numbers • Polar form of a complex number Polar Coordinates: • Definition of polar coordinates • Polar equations and graphs



	• Polar and cartesian coordinates • Graphing polar coordinate equations
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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 in solving problems. This will be achieved through classes, interactive tutorials, home works and quizzes.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	١٢٥		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 9	LO #1, 2, 10 and 11
	classwork	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	homework	2	10% (10)	6, 10	LO # 3, 4, 6 and 7
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Integration: Indefinite Integrals, Rules for Indefinite Integrals, Integration of Trigonometric Functions.
Week 2	Solving Initial Value Problems with Indefinite Integrals, Definite Integrals, Rules for Definite Integrals.
Week 3	Assignment + Quiz + Techniques of Integration, Basic Integration Formulas by Substitution, and



	Integration by Parts.
Week 4	Tabular Integration, Trigonometric Integrals, and Definite Integrals of Odd and Even Functions.
Week 5	Assignment + Quiz + Integration by Trigonometric Substitutions.
Week 6	Integrating Rational Functions by Partial Fractions.
Week 7	Integration by Substitution and Integrating of the Roots.
Week 8	Mid Term + Numerical integration: Trapezoidal Rule and Simpson Rule.
Week 9	Application of Integrals: Area Under a Curve and Finding Area between two Curves.
Week 10	Volume of Solids of Revolution.
Week 11	Length of Plane curves and Area of Surface of Revolution.
Week 12	Assignment + Quiz + Transcendental Functions: Inverse Functions and Logarithmic Functions.
Week 13	Complex Numbers, Complex Numbers and Operations, Graphical Representation of Complex Numbers, and Polar Form of a Complex Number.
Week 14	Polar Coordinates: Definition of Polar Coordinates, Polar Equations and Graphs, Polar and Cartesian Coordinates, and Graphing Polar Coordinate Equations.
Week 15	Assignment + Quiz + Review and solve related problems.
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas, G. B., Weir, M. D., Hass, J., Giordano, F. R., & Korkmaz, R. (2010). <i>Thomas' calculus</i> (Vol. 12). Boston: Pearson.	Yes
Recommended Texts		No
Websites		



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



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 3

Module Information					
معلومات المادة الدراسية					
Module Title	Physics		Module Delivery		
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	ENG 125				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		2			Semester of Delivery
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Jabar Rahem		e-mail	dr.jabar72@uomisan.edu.iq	
Module Leader's Acad. Title		Asst. Prof.	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		01/06/2025	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	Physics provides the student with sufficient information about the nature of materials and how to use measurement units in different systems to measure the different properties of materials through understanding their nature, entering into the energy system and preserving it, and providing him with important information about the types of movements and their representation with functions. Then study fluids and their principles



Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Physics plays a crucial role in the petroleum industry in various ways. Below are a few examples: 1. The principles of physics are extensively used to explore petroleum reservoirs. Techniques such as seismic surveying involve creating shock waves that penetrate the ground and are reflected on the surface by changes in rock layers. The data collected is then analyzed using physical principles to determine the structure and composition of the Earth's interior. This helps to locate possible petroleum reservoirs. 2. Fluid Dynamics: The study of fluid flow is a significant part of the petroleum industry. Oil recovery processes, such as primary, secondary, and tertiary, depend heavily on understanding how oil, water, and gas move through porous rock formations. The principles of fluid mechanics, a branch of physics, are fundamental in designing and optimizing these processes. 3. Thermodynamics: Petroleum extraction often involves changing pressure and temperature conditions. Understanding these changes and how they affect the properties of crude oil and natural gas is critical for efficient extraction and refining. For instance, phase changes from gas to liquid (condensation) and liquid to gas (evaporation) are common in the industry, governed by the principles of thermodynamics. 4. Reservoir Physics: Physics helps in understanding and modeling reservoir behaviors. Using different physical principles can predict how the reservoir will react to different drilling and extraction strategies, which can optimize the production strategy. 5. Materials Science: Physics also impacts the materials used in the petroleum industry. From the metallurgy of drill bits to the design of pipelines that can withstand extreme pressures and temperatures, an understanding of the physical properties of materials is essential. In summary, physics principles are fundamental to the petroleum industry, impacting everything from the initial exploration of oil and gas deposits to the extraction and refining of these resources.
Indicative Contents المحتويات الإرشادية	Materials Science: Physics also impacts the materials used in the petroleum industry. From the metallurgy of drill bits to the design of pipelines that can withstand extreme pressures and temperatures, an understanding of the physical properties of materials is essential.

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	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	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
	Presentation	1	10% (10)	11	LO # 5, 8 and 10
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	What Is Physics, Measuring Things, The International System of Units, Dimensions of some important variables, Energy, Work, Power, Gravitational Potential Energy, Kinetic energy, The Conservation of Energy, Oscillatory Motion, Simple Harmonic Motion
Week 2	Energy in Simple Harmonic Motion, Periodic time and sinusoidal nature for SHM, Position as a Function of Time in SHM, Velocity and Acceleration as Functions of Time in SHM. Wave motion, Types of Waves and Their Speeds: Transverse and Longitudinal Speed of Transverse Waves, Speed of Longitudinal Waves, Energy Transported by Waves, Intensity Related to Amplitude and Frequency.



Week 3	Wave motion, Types of Waves and Their Speeds: Transverse and Longitudinal Speed of Transverse Waves, Speed of Longitudinal Waves, Energy Transported by Waves, Intensity Related to Amplitude and Frequency. Sound waves, Fluid, Density, viscosity
Week 4	Pressure, Pascal principle, Archimedes principle, Phases of Matter, Density and Specific Gravity, Pressure in Fluids, Atmospheric Pressure and Gauge Pressure. quiz
Week 5	Gauge Pressure, Fluids in Motion; Flow Rate, the Equation of Continuity, Bernoulli's Equation, Heat, Specific Heat, Heat Transfer, Conduction
Week 6	Convection, Radiation, Coulomb's Law, Flux, Electric potential, Gauss law, Electric Charge and Electric Field, Insulators and Conductors, Semiconductors. Contact angle,
Week 7	Stress, Strain, Surface tension, Interfacial tension.
Week 8	Introduction to Temperature And Heat, Temperature and the Zeroth Law of Thermodynamics, Heat transfer and its methods, Temperature Scales, Specific heat, Specific volume, Calorimetry
Week 9	Phases and Properties of Pure Substances, Property Diagrams for Phase-Change Processes, Thermal equilibrium, Thermal expansion
Week 10	Linear, areal and volume expansion of solid, Volume expansion of liquid and gases, Gas laws, The Ideal-Gas Equation of State. Quiz.
Week 11	Compressibility Factor—A Measure of Deviation from Ideal-Gas Behavior, Other Equations of State, Exergy Transfer by Work, Applications of work.
Week 12	Energy Conversion and General Energy Analysis, Energy Balance, Energy Change of a System, and Mechanisms of Energy Transfer, Thermal Energy Reservoirs, Heat Engines, Basic Considerations in the Analysis of Power Cycles, The Carnot Cycle and Its Value in Engineering
Week 13	Basic Considerations in the Analysis of Power Cycles, The Carnot Cycle and Its Value in Engineering Entropy, Entropy Change of Liquids and Solids,
Week 14	The Entropy Change of Ideal Gases Entropy, Entropy Change of Liquids and Solids, The Entropy Change of Ideal Gases
Week 15	Completion of student presentations Exam preparation and review
Week 16	Preparatory week before the final Exam



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Halliday, David, Robert Resnick, and Jearl Walker. <i>Fundamentals of physics</i> . John Wiley & Sons, 2013.	
Recommended Texts	Serway, R. A., & Jewett, J. W. (2018). <i>Physics for scientists and engineers</i> . Cengage learning.	
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.



Module 4

Module Information					
معلومات المادة الدراسية					
Module Title	Thermodynamic			Module Delivery	
Module Type	Basic			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	PE 122				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level			1		
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Qudama Mohammed Qasim		e-mail	qudamaalyasiri@uomisan.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		01/06/2025	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	Thermodynamic provides the student with sufficient information about the nature of materials and how to use measurement units in different systems to measure the different properties of materials through understanding their nature, entering into the energy system and preserving it, and providing him with important information about the types of movements and their representation with functions. Then study fluids and their principles
Module Learning Outcomes	Thermodynamic plays a crucial role in the petroleum industry in various ways. Below are a few examples:



مخرجات التعلم للمادة الدراسية	1. The principles of Thermodynamic are extensively used to explore petroleum reservoirs. Techniques such as seismic surveying involve creating shock waves that penetrate the ground and are reflected on the surface by changes in rock layers. The data collected is then analyzed using physical principles to determine the structure and composition of the Earth's interior. This helps to locate possible petroleum reservoirs. 2. Fluid Dynamics: The study of fluid flow is a significant part of the petroleum industry. Oil recovery processes, such as primary, secondary, and tertiary, depend heavily on understanding how oil, water, and gas move through porous rock formations. The principles of fluid mechanics, a branch of physics, are fundamental in designing and optimizing these processes. 3. Thermodynamics: Petroleum extraction often involves changing pressure and temperature conditions. Understanding these changes and how they affect the properties of crude oil and natural gas is critical for efficient extraction and refining. For instance, phase changes from gas to liquid (condensation) and liquid to gas (evaporation) are common in the industry, governed by the principles of thermodynamics. 4. Reservoir Physics: Thermodynamic helps in understanding and modeling reservoir behaviors. Using different physical principles can predict how the reservoir will react to different drilling and extraction strategies, which can optimize the production strategy. 5. Materials Science: Thermodynamic also impacts the materials used in the petroleum industry. From the metallurgy of drill bits to the design of pipelines that can withstand extreme pressures and temperatures, an understanding of the physical properties of materials is essential. In summary, Thermodynamic principles are fundamental to the petroleum industry, impacting everything from the initial exploration of oil and gas deposits to the extraction and refining of these resources.
Indicative Contents المحتويات الإرشادية	Reservoir Physics: Thermodynamic helps in understanding and modeling reservoir behaviors. Using different physical principles can predict how the reservoir will react to different drilling and extraction strategies, which can optimize the production strategy.

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	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	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
	Group Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	homework	1	10% (10)	9	LO # 3, 4, 6 and 7
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Energy in Simple Harmonic Motion, Periodic time and sinusoidal nature for SHM, Position as a Function of Time in SHM, Velocity and Acceleration as Functions of Time in SHM. Wave motion, Types of Waves and Their Speeds
Week 2	Transverse and Longitudinal Speed of Transverse Waves, Speed of Longitudinal Waves, Energy Transported by Waves, Intensity Related to Amplitude and Frequency.
Week 3	Gauge Pressure, Fluids in Motion; Flow Rate, the Equation of Continuity



Week 4	Bernoulli's Equation, quiz
Week 5	Heat, Specific Heat, Heat Transfer, Conduction
Week 6	Convection, Radiation, Coulomb's Law, Flux, Electric potential, Gauss law, Electric Charge and Electric Field, Insulators and Conductors, Semiconductors. Contact angle,
Week 7	Introduction to Temperature And Heat, Temperature and the Zeroth Law of Thermodynamics
Week 8	Heat transfer and its methods, Temperature Scales, Specific heat, Specific volume, Calorimetry
Week 9	Phases and Properties of Pure Substances, Property Diagrams for Phase-Change Processes, Thermal equilibrium, Thermal expansion
Week 10	Linear, areal and volume expansion of solid, Volume expansion of liquid and gases, Gas laws, The Ideal-Gas Equation of State. Quiz.
Week 11	Compressibility Factor—A Measure of Deviation from Ideal-Gas Behavior, Other Equations of State, Exergy Transfer by Work, Applications of work.
Week 12	Energy Conversion and General Energy Analysis, Energy Balance, Energy Change of a System, and Mechanisms of Energy Transfer, Thermal Energy Reservoirs, Heat Engines, Basic Considerations in the Analysis of Power Cycles, The Carnot Cycle and Its Value in Engineering
Week 13	Basic Considerations in the Analysis of Power Cycles, The Carnot Cycle and Its Value in Engineering Entropy, Entropy Change of Liquids and Solids,
Week 14	The Entropy Change of Ideal Gases Entropy, Entropy Change of Liquids and Solids, The Entropy Change of Ideal Gases
Week 15	Completion of student presentations Exam preparation and review
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Halliday, David, Robert Resnick, and Jearl Walker. <i>Fundamentals of physics</i> . John Wiley & Sons, 2013.	
Recommended Texts	Serway, R. A., & Jewett, J. W. (2018). <i>Physics for scientists and engineers</i> . Cengage learning.	
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group	A - Excellent	امتياز	90 - 100	Outstanding Performance



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



(50 - 100)	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 5

Module Information					
معلومات المادة الدراسية					
Module Title	Chemistry		Module Delivery		
Module Type	B		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	ENG 126				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		1			Semester of Delivery
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Hanon Hussan		e-mail	Dr.hanon68@uomisan.edu.iq	
Module Leader's Acad. Title		Assist. Prof	Module Leader's Qualification		Phd
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		01/06/2025	Version Number		

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. Review of basic concepts: This includes reviewing the fundamental concepts in chemistry and ensuring a proper understanding of them. 2. Chemical stoichiometry: This involves studying percentages, chemical reactions, and the associated calculations. 3. Chemical reactions and heat: This include studying chemical reactions and the energy released or consumed during these reactions.



	4. Organic chemistry: This focuses on the study of organic compounds and their chemical functions. 5. Fuels: This involves studying different types of fuels, their properties, and their uses. 6. Various batteries and electronic cells: This include studying different types of batteries and electronic cells and their applications. 7. Principles of corrosion: This aims to understand the principles of corrosion, its mechanisms, and methods of prevention. 8. Water for domestic uses: This relates to the properties of water and its applications in domestic settings and water treatment. 9. Industrial water: This focuses on the properties and uses of water in industry and its treatment. 10. Atmospheric pollution: This involves studying air pollution, its sources, and its impact on the environment.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. A solid understanding of the fundamental concepts in chemistry. 2. The ability to study percentages, chemical reactions, and perform related calculations. 3. Understanding of chemical reactions and the energy released or consumed during these reactions. 4. Comprehensive knowledge of organic compounds and their chemical functions. 5. Study of different types of fuels, their properties, and their uses. 6. In-depth understanding of various batteries, electronic cells, and their applications. 7. Understanding the principles of corrosion, its mechanisms, and preventive methods. 8. Understanding the properties of water and its applications in domestic settings and water treatment. 9. Knowledge of the properties and uses of water in industry and its treatment. 10. Study of air pollution, its sources, and its impact on the environment.
Indicative Contents المحتويات الإرشادية	1- Review of basic concepts: Reviewing fundamental concepts in chemistry such as atoms, elements, and molecular structure. Chemical forces, reactions, and chemical equilibrium. Factors affecting the rate of chemical reactions. 2- Chemical stoichiometry: Calculating chemical stoichiometry and related chemical reactions. Using percentages and chemical equations in stoichiometry calculations. 3- Chemical reactions and heat: Studying the energy released or consumed during chemical reactions. Applying the concept of heat changes in chemical reactions. 4- Organic chemistry: Studying organic compounds, their classification, and chemical properties. Understanding basic organic reactions and their chemical functions.



	5- Fuels: Studying different types of fuels, including fossil fuels and biofuels. Understanding the properties and uses of fuels in industry, transportation, and energy. 6- Various batteries and electronic cells: Studying different types of batteries and electronic cells and their operating principles. Exploring applications of batteries and electronic cells in electronic devices and renewable energy. 7- Principles of corrosion: Studying corrosion mechanisms and contributing factors. Analyzing different types of corrosion, such as chemical corrosion and electrochemical corrosion. Studying corrosion prevention and protection techniques, such as the use of corrosion-resistant materials and protective coatings. 8- Water for domestic uses: Understanding the properties of water and its treatment for domestic purposes. Studying water quality standards and household water treatment processes like filtration and disinfection. 9- Industrial water: Exploring the uses of water in industry and understanding the treatment methods for industrial water preparation. Studying the applications of water in industrial processes such as cooling, cleaning, and drying. 10- Atmospheric pollution: Studying sources of air pollution and their impact on the environment and public health. Analyzing common air pollutants such as greenhouse gases, particulate matter, and volatile organic compounds. Studying pollution control techniques and legislation related to air quality protection. This academic curriculum aims to enhance students' understanding of the fundamental concepts and knowledge in these various chemical fields and raise awareness of relevant environmental issues. The expected outcomes for students include a deeper understanding of chemical principles and the ability to apply them in different scientific and technological contexts.
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy in delivering the Chemistry module to first-year students in the Petroleum Engineering department relies on both theoretical and practical aspects, including laboratory work, homework assignments, and scientific report writing. The strategy emphasizes encouraging student participation in exercises and interactive learning while developing and expanding their practical skills through hands-on laboratory work. The focus will be on acquiring theoretical and practical knowledge, completing homework assignments, and preparing scientific reports and projects.
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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.	7	14% (14)	Continuous	All
	Report	1	6% (6)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Review Of Basic Concepts (Analytical Chemistry)
Week 2	Concentration & Units for Expressing Concentration
Week 3	Chemical Stoichiometry
Week 4	Chemical Reactions and Heat
Week 5	Organic Chemistry
Week 6	Types of Hydrocarbons
Week 7	Mid-Term Exam
Week 8	Introduction to Fuels
Week 9	Various Batteries and Electronic Cells
Week 10	Principles Of Corrosion
Week 11	Control Of Corrosion
Week 12	Environmental Pollution
Week 13	Industrial Water
Week 14	Water For Domestic Uses
Week 15	Water Pollution and Preparatory Week Before the Final Exam
Week 16	Preparatory Week Before the Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Preparation of a solution of pure sodium carbonate (initial standard solution)
Week 2	Preparation of hydrochloric acid solution (secondary standard solution)
Week 3	Titration of Hydrochloric Acid with Sodium carbonate
Week 4	Titration of Hydrochloric Acid with Sodium Hydroxide
Week 5	The reaction of a mixture (strong base and weak base) with a strong acid
Week 6	
Week 7	



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Quantitative Chemical Analysis" by Daniel C. Harris 2. Chemistry: The Central Science" by Theodore L. Brown, H. Eugene LeMay, Bruce E. Bursten, Catherine Murphy, and Patrick Woodward 3. Organic Chemistry" by Paula Yurkanis Bruice 4. Principles of Corrosion Engineering and Corrosion Control" by Zaki Ahmad 5. Environmental Chemistry" by Stanley E. Manahan	
Recommended Texts		
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.



Module 6

Module Information					
معلومات المادة الدراسية					
Module Title	English language I			Module Delivery	
Module Type	Basic			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	UOM 120				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		1	Semester of Delivery		
Administering Department		Petroleum Eng.	College	UoM	
Module Leader	Dheyaa Sabeeh AL-SAEDI		e-mail	Diaa.sabeeh@uomisan.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		Master
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		01/06/2025	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 module aims to provide students with a comprehensive understanding of reading comprehension strategies, essential grammar structures, vocabulary development, and effective communication skills. By the end of the module, students should be able to read and understand various texts, use grammar structures accurately, expand their vocabulary, and communicate effectively in English.



Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the module, students should have developed their reading comprehension skills, acquired a solid understanding of the grammar structures covered, expanded their vocabulary, and improved their speaking and listening abilities. They should be able to communicate effectively in English, understand and analyze various texts, and use idiomatic expressions and collocations appropriately.
Indicative Contents المحتويات الإرشادية	These indicative contents provide an overview of the specific areas and topics covered within the syllabus, focusing on reading comprehension, grammar structures, vocabulary development, speaking and listening skills, and assessment. The actual content and materials used may vary based on the curriculum and resources available.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The strategies aim to create an engaging and interactive learning environment where students can actively participate in language acquisition. The combination of explicit instruction, meaningful practice, and real-world application helps students develop their language skills effectively.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.25
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
	Group Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Presentation	1	10% (10)	9	LO # 5, 8 and 10



	Homework	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to the course and syllabus overview Reading Comprehension: Strategies for effective reading Structure Item: Present Simple (Formation and usage)
Week 2	Reading Comprehension: Main ideas and supporting details Structure Item: Present Continuous (Formation and usage)
Week 3	Reading Comprehension: Inference and critical thinking skills Structure Item: Past Simple (Formation and usage)
Week 4	Reading Comprehension: Vocabulary development and context clues Structure Item: Past Continuous (Formation and usage)
Week 5	Reading Comprehension: Summarizing and synthesizing information Structure Item: Present Perfect (Formation and usage) Quiz
Week 6	Reading Comprehension: Text organization and paragraph comprehension Structure Item: Future Simple (Formation and usage)
Week 7	Reading Comprehension: Practice with different text types (fiction, non-fiction, etc.) Structure Item: Conditional Statements (Types I, II, III)
Week 8	Reading Comprehension: Practice with longer passages and multiple-choice questions Structure Item: Indirect Questions
Week 9	Reading Comprehension: Analyzing author's tone and purpose Structure Item: Simple Statement and Definite/Indefinite Articles
Week 10	Reading Comprehension: Practice with comprehension questions and short answer responses Structure Item: Idioms (Introduction and common examples) Quiz
Week 11	Speaking and Listening Skills: Oral presentations and discussions Structure Item: Review of previously covered grammar structures
Week 12	Speaking and Listening Skills: Role-plays and debates Structure Item: Review and reinforcement of grammar structures
Week 13	Speaking and Listening Skills: Group discussions and problem-solving activities



	Vocabulary Development: Idioms and collocations (continued practice) Report due
Week 14	Vocabulary Development: Expanding vocabulary through reading and word exercises Speaking and Listening Skills: Listening comprehension activities and note-taking practice
Week 15	Final Project and Exam Preparation Completion of the project Exam preparation and review
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Headway 1 Academic Skills 1 Listening and Speaking Student's Book	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.



Module 7

Module Information					
معلومات المادة الدراسية					
Module Title	Engineering Drawing			Module Delivery	
Module Type	Basic			☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	ENG 128				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level			1		
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Mushtaq Abbas Al-Furaiji		e-mail	eng.mushtaq@uomisan.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		01/06/2025	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 engineering drawing and descriptive geometry module is designed to deliver overview understanding of the basics, principles and techniques involved in engineering drawing and descriptive geometry. This course deals with identifying engineering drawing tools and materials, methods of using them, performing manual exercises, drawing lines, curves, and two- and three-dimensional shapes. Thus, developing the student's potential to study and



	apply the basics of engineering drawing. Which includes reading, disassembling and assembling geometric shapes through drawing, projection, and sections methods.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowing the tools used in engineering drawing and how to use them properly. 2. The student's ability to understand and apply the basics of engineering drawing. 3. Reading, disassembling and assembling geometric shapes through drawing, projection and cross-sectional methods. 4. Developing the student's skill in using tools in drawing geometric shapes. 5. Developing the student's engineering imagination through deducing the projections and sections of each geometric solid and realizing its dimensions. 6. Communicate with the most important ideas presented by the article through Internet.
Indicative Contents المحتويات الإرشادية	1- Introduction to the subject: basics of engineering drawing and the difference between it and free hand drawing: Engineering drawing, its elements, tools and drawing methods. 2- Introducing students to paper scales and drawing boards, and Free hand drawing (lines, circles, ...etc) 3- Distribute the canvas (frame, table, etc.), Types of lines in engineering drawing, Rules for writing dimensions and measurements and recognizing symbols and their significance, drawing scales (zoom in and zoom out) 4- Construction and engineering operations: Create and divide angles, Divide circles and draw regular shapes in them. Create connecting lines between arcs and circles. 5- Drawing engineering perspectives, Types of engineering perspectives and its construction from projections. Perspective constructions (drawing 3D solids (isometric perspective) 6- Projection in orthogonal planes, vertical projection methods, Drop geometric shapes. 7- Distribution of projections on the drawing board, Conclusion of the third projection from two projections. 8- Inferring the isometric perspective from projections with dimensions 9- Single simple and complex geometric objects 9- Sections in engineering drawing, their importance, Cutting, sector, and hatching levels, Types of sectors and their classification. 10- Using real 3D models to help students see the 2D model drawn in the book (as a way of elucidation more acceptable to students).
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Planning a unit or lesson involves a number of instructional decisions. The teacher must identify the following: the content and processes to be addressed, the strengths, needs, and interests of students, the Common Essential Learnings that could be incorporated, and the most effective instructional approaches. Such decisions are critical and must be made consciously and purposefully. It begins with the student's interest in engineering tools and the drawing board. To reach the highest level of understanding in the application of all theoretical and laboratory lesson processes.



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/classwork	15	15% (15)	Continuous	All
	Assignments/Homework	10	10% (10)	Continuous	All
	Report	1	5%(5)	9	LO # 1-7
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview of engineering drawing objectives, importance and applications. Drawing tools and instruments, Types of paper and their scales, Drawing boards.
Week 2	Lines in engineering drawing, Type of lines. Paper layout (frame, title block), drawing simple shapes using different types of lines, and practice on how to use drawing tools.
Week 3	Lettering and numbering (Arabic and English), simple engineering operations.



Week 4	Engineering operations of lines, angles, triangles; divide, transfer, parallel and drawing.
Week 5	Engineering operations of circles and arcs. Quiz 1
Week 6	Engineering operations of Polygon, Hexagonal, pentagonal and quadruple.
Week 7	Engineering operations of Ellipse, types of Ellipses. Mid-term exam.
Week 8	Engineering operations of tangential; lines, arc and two circles.
Week 9	Orthogonal projections; first angle of projections, third angle of projections.
Week 10	Concluding 3rd projector and do more exercise of projection drawing. Quiz 2
Week 11	Notes on projection's topic, projections of complex parts (complex shape)
Week 12	Principle of section; section lines, full sections, section planes, half sections, zigzag sections.
Week 13	Partial sections, Non-cut parts, Notes on sections.
Week 14	Theory of dimensions, Dimension elements, Oblique dimensions, Dimension symbols.
Week 15	Leader dimensions, Circle and angle dimensions. Notes on dimensions
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Systematic engineering drawing book , author Jaafar Al-Khafaf كتاب الرسم الهندسي المنهجي, للمؤلف عبد الرسول الخفاف - Descriptive Geometry; S.P. Burkova, G.F. Vinokurova, R.G. Dolotova	Yes
Recommended Texts	- Luzadder, Fundamentals of Engineering Drawing, Prentice. - French, C.J. Vierck and R.J. Foster, Engineering Drawing and Graphic Technology, McGraw-Hill, 1981.	No



Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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2- Level II

First semester

Module 1

Module Information					
معلومات المادة الدراسية					
Module Title	Structural Geology		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☐ Seminar		
Module Code	PE 211				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		2	Semester of Delivery		1
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Maser Mahmood Kalaf		e-mail	maser@oumisan.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		01/06/2025	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	Structural Geology: Structural geology is a module within the petroleum engineering department that focuses on the study of geological structures and their significance in the exploration and production of hydrocarbons. It explores the deformation and tectonic processes that have shaped the Earth's crust and their implications for the distribution and behavior of subsurface reservoirs. The Structural Geology module provides petroleum engineering students with a fundamental understanding of geological structures and their importance in hydrocarbon exploration and production. It enables them to analyze and interpret



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	subsurface data, assess reservoir potential, and make informed decisions regarding well placement, drilling operations, and reservoir management. Within structural geology, which is the main focus of the course, you will learn in-depth about geological structures that form in different tectonic regimes, the process of their formation, their geometry, and their physical properties. The course also consists of a practical module where you will learn to measure and analyze these structures both in the field and in the laboratory.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students will learn theory of stress and deformation of rocks, classification and formation of geological structures, such as faults, folds, foliations, and lineations, and about the formation of geological structures in different tectonic regimes and conditions. Moreover, students can define the stress and strain and can relate these to the geometry of folded and faulted regions
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	After taking this course, students should be able to: ➤ Differentiate between tectonic and structural geology topics. ➤ Know the structural set-up of different tectonic regimes. ➤ Know the brittle, ductile and plastic deformation. ➤ Understand deformation mechanisms at micro- and macro-scales. ➤ Describe the geometry and properties of different deformation structures. ➤ Run structural fieldwork and use structural field data in geometrical and kinematic analyses. ➤ Visualize and interpret structural observations and measurements with the help of stereo nets. ➤ Interpret geological maps and profiles and use stereographic projection to solve structural geologic problems. ➤ Use digital tools such as compass, stereo net, GPS to collect and interpret data.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
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	3	15% (15)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	6% (6)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	7	14% (14)	Continuous	All
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Structural Geology The Earth is a Dynamic Planet Understanding Plate Tectonic Theory Why is structural geology important?
Week 2	The Fundamental Structures Categories of Geological Structures Contacts between Rock Bodies Primary Structures Secondary Structures
Week 3	Dynamic Analysis of Stress Force, stress, and strength Types of stresses Shear Stress and Normal Stress The Fundamental Equations for Stress Calculation of Lithostatic Stress Overburden Stress Mohr Circle for Stress Quiz
Week 4	Kinematic Analysis of Strain Rock Deformation Types of Deformation Controls on Deformation of a Rock



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	Progressive Deformation
Week 5	Kinematic Analysis of Strain Components of Kinematics Analysis Deformation and strain Types of strain Fundamental Strain Equations Pure and Simpler Shear Strain
Week 6	Kinematic Analysis of Strain Mohr Strain Diagram Homogenous Strain Special Types of Homogenous Strain Relationship Between Stress and Strain Limitation of The Concept of Stress in Structural Geology
Week 7	Mohr-Coulomb failure Compressive Strength Tests Tensile strength tests with no confining pressure Determining Failure Envelope Quiz
Week 8	Mohr-Coulomb failure Coulomb Law of Failure Byerlee's Law Von Mises failure envelope Effect of pore-fluid pressure
Week 9	Joints and Shear Fractures Joints Classification of joints Importance of Joints Modes of fractures
Week 10	Joints and Shear Fractures Origin of Joints Joint Systems Categories of Joints Fracture Analysis Dynamic interpretation of fractures Conjugate shear fractures
Week 11	Faults Types of Faults Normal and Detachment Faults Reverse and Thrust Faults Quiz



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Week 12	Faults Strike-Slip Faults Oblique slip faults Grabens and Horsts
Week 13	Folds and Folding Geometric Features of a Fold Fold Classification Anticlines and Synclines Geometry of the Fold
Week 14	Folds and Folding Fold Systems Special fold types (Chevron Folds) Dynamics of Folding Kinematic Models of Folding
Week 15	Final Project and Exam Preparation Completion of a Structural Geology project Exam preparation and review
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Orientation of Structures (Strike and dip measurements)
Week 2	Lab 2: Drawing Geological Cross Section Profile and Interpretation of Geological Maps
Week 3	Lab 3: Geometric Methods: Attitude Calculations Using Three-Point Problems
Week 4	Lab 4: Geometric Methods: Dimension Calculations
Week 5	Lab 5: Stereographic Projections (Stereonets): Angles between Lines and Planes
Week 6	Lab 6: Calculation of Layer Attitude in Drill Holes
Week 7	Lab 7: Analysis of Data from Rock-Deformation Experiments



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
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Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<i>Structural Geology. Twiss and Moores (2007) (2nd Edition). W.H. Freeman and Company.</i>	No
Recommended Texts	<i>STRUCTURAL GEOLOGY: An Introduction to Geometrical Techniques, Donald M. Ragan, 2009, Cambridge University Press, 632 pp.</i>	No
Websites	https:// petrowiki.spe.org/Structural_geology	

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 2

Module Information					
معلومات المادة الدراسية					
Module Title	Electrical Engineering Technology		Module Delivery		
Module Type	B		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	PE 212				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		٢	Semester of Delivery		١
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Jabbar Raheem Rashed		e-mail	dr.jabar72@uomisan.edu.iq	
Module Leader's Acad. Title		Asst. Professor	Module Leader's Qualification		PhD
Module Tutor			e-mail		
Peer Reviewer Name				e-mail	
Scientific Committee Approval Date		01/06/2025	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	- فهم ومعرفة دوائر التيار المستمر
أهداف المادة الدراسية	



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	- التعرف على رموز الدوائر الكهربائية للتيار المستمر. - تطوير مهارات الطالب في استخدام طرق التحليل و نظريات الشبكات. - تطوير التفكير المجرد، المنطقي والناقد والقدرة على التفكير بشكل حاسم على عملهم وعمل الآخرين
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	أ الأهداف المعرفية - التعرف الرموز و المصطلحات الأساسية للهندسة الكهربائية. - التعرف أساسيات دوائر التيار المستمر. - معرفة كيفية استخدام طرق التحليل. - معرفة نظريات الشبكات الكهربائية. - التعرف على حل الدوائر الكهربائية باستخدام طرق التحليل ونظريات الشبكات. ب الأهداف المهاراتية الخاصة بالمقرر - التعرف على حل مشاكل الدوائر الكهربائية المتعلقة. - التعرف على استخدام الحاسبات العلمية المتقدمة . - التعرف على كيفية استخدام أقصر الحلول في الهندسة الكهربائية . - التعرف على كيفية إيجاد الحل للمشاكل الهندسية باستخدام طرق التحليل.
Indicative Contents المحتويات الإرشادية	زيادة المعرفة للمسؤولية المهنية والأخلاقية للمهندس. القدرة على التواصل بشكل فاعل تأثير الحلول الهندسية في السياق الاقتصادي والبيئي والاجتماعي خلق روح مواصلة التعلم ومواكبة التطورات العلمية في مجال العمل القدرة على استخدام التقنيات والمهارات والأدوات الهندسية الحديثة اللازمة لممارسة مهنة الهندسة.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	الطريقة الألفائية الطريقة الحوارية الطريقة النشطة (تعتمد على نشاط الطالب)
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Student Workload (SWL)



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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	3	15% (15)	5, 10	LO #1, 2, 10 and 11
	Assignments	1	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	7	14% (14)	Continuous	All
	Report	1	6% (6)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to D.C circuits Elect. Quantities Charge Elect. Force
Week 2	Conductors and insulators Current Elect. potential and voltage Energy and power



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
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Week 3	Fundamentals of elect. Circuits Resistance & resistivity
Week 4	conductance & conductivity Effect of temp. on resistance Sources (voltage & current sources)
Week 5	Ohms law Kirchhoff's laws
Week 6	Principles of elect. circuits Series and parallel circuits
Week 7	Voltage divider rule Current divider rule
Week 8	Method of analysis Branch current method
Week 9	Mesh analysis
Week 10	Star-delta and delta-star conversion
Week 11	Network theorems. Superposition theory
Week 12	Source Transformation
Week 13	Thevenin's theorem
Week 14	Norton's Theorem
Week 15	Maximum transfer theorem
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction
Week 2	Lab 2: Kirchhoff's Voltage and Current Laws Experiment
Week 3	Lab 3: Ohms Law
Week 4	Lab 4: Open & close Circuit
Week 5	Lab 5: Superposition
Week 6	Lab 6: Thevenin's Theorem and Kirchhoff's Laws
Week 7	Lab 7: Norton's Theorem and Kirchhoff's Laws



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Past lectures	Yes
Recommended Texts	Introductory Circuit Analysis, Boylestad	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

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Module 3

Module Information				
معلومات المادة الدراسية				
Module Title	Fluid Mechanics I (Static)		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	PE 213			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	2	Semester of Delivery		
Administering Department		Petroleum Eng.	College	Engineering College
Module Leader	Saad Hanon		e-mail	saadhanoon82@gmail.com
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		01/06/2025	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. Introduce basic definitions and introductory concepts of fluid mechanics. 2. Introduce the description of pressure distribution in a static fluid 3. Introduce the description of phenomena associated with measuring static pressure in oil well and fluid mechanics applications in Petroleum Engineering. 4. Introduce Explain and derive the conservation laws that govern fluid motion (continuity, energy, and momentum equations). 5. Drive Bernoulli's Equation and its applications.



Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Define Fluids and Fluid Mechanics and distinguish between incompressible and compressible fluids, and understand and define the basic fluid properties; especially density and viscosity, and apply Newton's law of viscosity. 2. Calculate; the pressure in static fluid and understand how can calculate the static pressure in oil and gas well. 3. Understand the types of fluid and what are the Newtonian and non-Newtonian fluid 4. Be familiar with continuity, energy, and momentum equations, and their applications to fluid mechanics problems. 5. Be able to apply modern knowledge and to apply mathematics, science, engineering and technology to fluid mechanics problems and applications.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Definition of fluid, Units and dimensions (Systems of units) the centimeter-gram-second (cgs) system, the meter-kilogram-second (mks system and the Systeme International unites (SI), British engineering system, Properties of fluid (Viscosity, Newtonian, non-Newtonian, density, surface tension, capillary Fluid static, Pascal law, Variation of pressure of a fluid at rest, Measurement of Pressure (Absolute pressure, Gauge pressure, Vacuum pressure), Manometer (mercury barometer, piezometer tube, the U-tube manometer, and the inclined-tube manometer), Pressures in oil and gas well. General Conservation Laws, Steady-state mass balance for fluid flow, Energy Balances, Bernoulli's Equation, The Energy Line and the Hydraulic Grade Line, Application of use Bernoulli equation Free jet, Spraying Water into the Air, Siphoning Out Gasoline from a Fuel Tank, Measurement (Velocity Measurement by a Pitot Tube, the orifice meter, the nozzle meter, and the Venturi meter)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Fluid mechanics is an important area of study in physics and engineering. There are several learning and teaching strategies that instructors can use to help facilitate student understanding of this complex topic. Here are a few: Hands-on experience: One of the best ways to learn about fluid mechanics is through hands-on experiences. Students can conduct experiments, work on projects, and participate in simulations that allow them to directly see the principles of fluid mechanics in action. Visual aids: Another effective teaching strategy is the use of visual aids such as animations, diagrams, and videos. These can help to illustrate complex concepts in a more easily understandable way.
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جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
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كل وحدة ائتمانية = ٢٥ ساعة



	Active learning: Active learning strategies, such as group work and problem-based learning, can help students to better understand fluid mechanics by encouraging them to interact with the material and each other. Real-world examples: Using real-world examples can be a very effective teaching strategy in fluid mechanics. Students can better understand how these principles are applied in real life and this can help to increase their engagement and understanding. Concept mapping: Concept mapping is a teaching strategy where students create visual representations of their understanding of a particular topic. This can be particularly effective in fluid mechanics as it can help students to better understand the relationships between different concepts
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Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب 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
	Presentation	1	10% (10)	6, 13	LO # 5, 8 and 10
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introductory concepts to fluid mechanics
Week 2	Units and dimensions
Week 3	Properties of fluids
Week 4	Types of fluid (Newtonian and non-Newtonian fluids)
Week 5	Fluid statics: pressure distribution in static fluids
Week 6	Pressure measurements
Week 7	Mid-term Exam
Week 8	Fluid statics: application in petroleum Engineering
Week 9	Steady-state mass balance for fluid flow
Week 10	Energy Balances
Week 11	Bernoulli's Equation
Week 12	The Energy Line and the Hydraulic Grade Line
Week 13	Application of use Bernoulli equation
Week 14	Measurement of velocity
Week 15	Momentum balance
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamentals of Fluid Mechanics by Munson	online
Recommended Texts		No
Websites		



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
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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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	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 4

Module Information					
معلومات المادة الدراسية					
Module Title	MATHEMATICS III		Module Delivery		
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	ENG 201				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		2	Semester of Delivery		1
Administering Department		Mech. Department	College	Engineering College	
Module Leader	Ali AL-MALIKI		e-mail	ali.al-maliki@uomisan.edu.iq	
Module Leader's Acad. Title		Assist. Lec.	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		01/06/2025	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. Be educated on Mathematics methods. 2. Know the procedure of calculations. 3. Develop students understanding of useful Mathematics methods in engineering calculations. 4. Studying and solve applications using Mathematics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The main outcome is a student have the knowledge of useful mathematics methods makes him deal with the problems, applications and calculations in different branches of science in petroleum engineering
Indicative Contents المحتويات الإرشادية	

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 examples and exercises, while at the same time refining and expanding their logical thinking skills. This will be achieved through classes, interactive tutorials and by considering solving of simple applications.
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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	62	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	3	15% (15)	5, 9, 14	All
	Class Assignments	2	10% (10)	7, 12	All
	Homework	2	10% (10)	3, 11	All
	Report	1	5%(5)	13	All
Summative assessment	Midterm Exam	1 hr	10% (10)	7	All
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week 1	Chapter One: Polar Coordinates • Definition of Polar Coordinates. • Relating Polar and Cartesian Coordinates.
Week 2	Chapter One: Polar Coordinates • Graphing in Polar Coordinates
Week 3	Chapter One: Polar Coordinates • Standard Polar curves • Homework
Week 4	Chapter One: Polar Coordinates • Areas in Polar Coordinates • Assignment
Week 5	Chapter One: Polar Coordinates • Lengths in Polar Coordinates • Quiz.
Week 6	Chapter Two: Vectors • Definitions, vectors in 2D and 3D • Properties of Vector Operations - Unit Vectors



Week 7	Chapter Two: Vectors - The Dot Product - Properties of the Dot Product - Assignment
Week 8	Chapter Two: Vectors - The Cross Product - Properties of the Cross Product - The Cross Product of Two Vectors in Space
Week 9	Chapter Two: Vectors - Triple Scalar - Applications - Quiz.
Week 10	Chapter Three: Vector valued function - limits, derivatives, and integrals of vector valued function - Motion along curves Midterm Exam
Week 11	Chapter Four: INFINITE SEQUENCES AND SERIES - Introduction to Infinite series - Infinite Sequence Homework
Week 12	Chapter Four: INFINITE SEQUENCES AND SERIES - Convergence and Divergence - Limit of the sequence - The Sandwich Theorem for Sequences - L'Hôpital's Rule - Assignment
Week 13	Chapter Four: INFINITE SEQUENCES AND SERIES - Infinite Series - Geometric Series
Week 14	Chapter Four: INFINITE SEQUENCES AND SERIES - The Integral Test - The Ratio Test - The p – Series Test - Quiz
Week 15	Chapter Four: INFINITE SEQUENCES AND SERIES Taylor and Maclaurin Series
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
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جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Required Texts	George B. Thomas, Maurice D. Weir, Joel Hass, Frank R. Giordano - Thomas's calculus	yes
Recommended Texts	1. H.K. Dass - Advanced Engineering Mathematics-S Chand & Co Ltd (2007)	
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.



Module 5

Module Information					
معلومات المادة الدراسية					
Module Title	Petroleum Properties		Module Delivery		
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	PE 214				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		2	Semester of Delivery		1
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Hanon Hassan Mashkor		e-mail	Dr.Hanon68@uomisan.edu.iq	
Module Leader’s Acad. Title		Assist. Professor	Module Leader’s Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		20/06/2025	Version Number		1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	The main aims of the Petroleum Properties module will focus on the study of the physical and chemical properties of petroleum fluids. It is essential for petroleum
أهداف المادة الدراسية	



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	engineers to understand these properties as they directly influence the behavior of hydrocarbon reservoirs and the design of production and refining processes. By studying Petroleum Properties, students gain a comprehensive understanding of the behavior and characteristics of petroleum fluids. This knowledge is crucial for making informed decisions in reservoir management, production optimization, and field development planning.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The main module learning outcomes are: 1. Define the Composition of crude oil and its classifications 2. Identify the hydrocarbon and Nonhydrocarbon Components. 3. Recognize the chemical and physical properties. 4. Define the classification methods and Evaluation of Petroleum. 5. Discuss and Analysis of Crude Petroleum and its fractions 6. Define the Important Product-Properties and Test Methods 7. Study of the experimental test of crude oil properties and its products
Indicative Contents المحتويات الإرشادية	The main indicative contents are: 1. Petroleum properties (Nature of Petroleum Fluids, Crude oil properties), 2. Characterization and Properties of Pure Hydrocarbons (classification, chemical compositions, chemical and physical properties), 3. Characterization and Properties of Pure Hydrocarbons; Density, specific gravity and coefficient of expansion, 4. Characterization and Properties of Pure Hydrocarbons; Viscosity, molecular weight, vapor pressure, 5. Characterization and Properties of Pure Hydrocarbons; Specific heat, latent heat, heat of combustion, boiling range, flash point, pour point, 6. Prediction of the Composition of Petroleum Fractions, aniline point, penetration number, 7. Prediction of PNA Composition, Elemental Composition, Other Properties, 8. Petroleum fraction and products, Soften point, crude oil evaluation, 9. Distribution functions for Properties of Hydrocarbon-plus Fractions, 10. Fractional distribution and TBP curve,



	11. Characterization of Reservoir Fluids and Crude Oils, 12. Analysis of fractions, 13. Dehydration of crude oil, 14. Nature gas properties 15. Oilfield water properties
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategies that will be adopted in delivering this unit are: 1- Encourage students to participate in the exercises. This is achieved through classes and interactive educational programmers. 2- Improving and expanding critical thinking skills at the same time and by thinking about the type of simple experiments that include some sampling activities of interest to the students. 3-Raise students scientific and knowledge levels by employing the automatic technique, conversational approach, and active method.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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
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جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Formative assessment	Quizzes	2	10% (10)	5, 9	LO # 1, 2, 8,9 and 10
	Home Assignments	2	10% (10)	6, 11	LO # 3, 4, 6, 7 and 11
	Projects / Lab.	7	21% (21)	Continuous	All
	Report	1	9% (9)	13	LO # 5, 11 and 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1- 7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction of petroleum properties (Nature of Petroleum Fluids, Crude oil properties)
Week 2	Characterization and Properties of Pure Hydrocarbons (classification, chemical compositions, chemical and physical properties)
Week 3	Density, specific gravity and coefficient of expansion.
Week 4	Viscosity, molecular weight, vapor pressure.
Week 5	- Specific heat, latent heat, heat of combustion, boiling range, flash point, pour point. Quiz
Week 6	Prediction of the Composition of Petroleum Fractions, aniline point, penetration number.
Week 7	- Prediction of PNA Composition, Elemental Composition, Other Properties Mid- Term Exam
Week 8	Petroleum fraction and products, Soften point, crude oil evaluation.
Week 9	- Distribution functions for Properties of Hydrocarbon-plus Fractions Quiz



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Week 10	Fractional distribution and TBP curve.
Week 11	Characterization of Reservoir Fluids and Crude Oils
Week 12	Analysis of fractions
Week 13	Dehydration of crude oil
Week 14	Nature gas properties
Week 15	Oilfield water properties
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Relative density measurement for crude oil Experiment
Week 2	Lab 2: Flash point Experiment
Week 3	Lab 3: smoking point Experiment
Week 4	Lab 4: soften point Experiment
Week 5	Lab 5: Aniline point Experiment
Week 6	Lab 6: Radiation Heat Transfer Experiment
Week 7	Lab 7: Freezing point Experiment
Week 8	Lab 8: Melting point Experiment
Week 9	Lab 9: Ash Experiment
Week 10	Lab 10: TDS Experiment
Week 11	Lab 11: Partial distillation of crude oil
Week 12	Lab 13: Review
Week 13	Lab 14: Examination



Week 14	Lab 15: Final examination
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Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1-Text of lectures 2- Riazi, M. R. Characterization and properties of petroleum fractions. Vol. 50. ASTM international, 2005.	Yes
Recommended Texts	1- Properties of Petroleum Fluids 3rd Edition by William McCain.	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.				



Module 6

Module Information				
معلومات المادة الدراسية				
Module Title	English Language II		Module Delivery	
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	UOM 202			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	٢	Semester of Delivery		
Administering Department		Type Dept. PE	College	Type College Code
Module Leader	Dheyaa Sabeeh Jasim		e-mail	diaa.sabeeh@uomisan.edu.iq
Module Leader’s Acad. Title		Lecturer	Module Leader’s Qualification	Master
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name		Name	e-mail	E-mail
Scientific Committee Approval Date		01/06/2025	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 module is to improve the technical English language skills of students in the field of petroleum engineering. The primary focus will be on developing proficiency in reading, writing, speaking and listening to technical content related to petroleum engineering. This



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	module will also provide an understanding of the specific language used in the field and how to communicate effectively with other professionals.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of this module, students should be able to: 1. Understand and use technical vocabulary related to petroleum engineering. 2. Read and comprehend technical texts related to petroleum engineering. 3. Write technical reports and documents in a clear and concise manner. 4. Speak confidently about technical topics related to petroleum engineering. 5. Listen and understand technical discussions related to petroleum engineering.
Indicative Contents المحتويات الإرشادية	1. Introduction to technical English in petroleum engineering 2. Technical vocabulary and terminology used in petroleum engineering 3. Reading and comprehension of technical texts related to petroleum engineering 4. Writing technical reports and documents in a clear and concise manner 5. Developing effective presentation skills for technical topics 6. Listening and understanding technical discussions related to petroleum engineering 7. Roleplay and simulations for technical communication in petroleum engineering 8. Case studies and problem-solving exercises.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

	When it comes to learning and teaching technical English for petroleum engineering, there are several effective strategies that can be employed. Here are some suggestions: 1. Vocabulary Building: Emphasize the importance of petroleum engineering-specific vocabulary. Teach students industry-specific terminology, technical terms, and abbreviations commonly used in the field. Use real-world examples and case studies to reinforce vocabulary usage. 2. Reading Materials: Provide students with technical articles, research papers, industry reports, and manuals related to petroleum engineering. Encourage students to read and analyze these materials to improve their technical reading comprehension and understanding of industry-specific concepts. 3. Writing Practice: Assign writing tasks that require students to explain complex petroleum engineering concepts, write technical reports, or summarize technical research. Provide feedback and guidance to help students improve their technical writing skills. 4. Speaking and Listening Activities: Incorporate role-plays, discussions, and debates that focus on petroleum engineering topics. Encourage students to practice effective
Strategies	



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان

بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	communication skills, such as presenting technical information, participating in meetings, and delivering presentations. 5. Field Trips and Guest Speakers: Organize field trips to petroleum engineering sites, such as drilling or refining facilities, to give students exposure to real-world applications. Invite guest speakers from the industry to share their experiences and insights, allowing students to interact with professionals and learn about the language used in the field. 6. Multimedia Resources: Utilize multimedia resources, such as videos, podcasts, and interactive online modules, to engage students and provide them with visual and auditory learning opportunities. These resources can cover topics like reservoir engineering, drilling techniques, or petroleum production processes. 7. Language Practice: Incorporate language-focused activities, such as grammar exercises or language games, to reinforce technical English skills. Tailor these activities to address common language challenges faced by petroleum engineering students, such as using prepositions accurately or understanding technical phrasal verbs. 8. Collaborative Projects: Assign group projects that require students to work together to solve petroleum engineering-related problems or scenarios. This encourages collaboration, critical thinking, and language practice within the context of the field. Remember, adapting teaching strategies to the needs and proficiency levels of students is crucial. Provide ample opportunities for practice, feedback, and individualized support to help students develop their technical English skills effectively.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	2	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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
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جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Formative assessment	Quizzes	4	10% (10)	5, 10	LO #1, 2, 10 and 11
	Classwork	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Presentation	1	10% (10)	9	LO # 5, 8 and 10
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Analysis and function of the elements contained in sentences and clauses
Week 2	Analysis and function of the elements contained in sentences and clauses
Week 3	An international industry 1. Reading: An international company 2. Language spot (a, an, the) 3. Vocabulary: Tools and hardware 4. Pronunciation
Week 4	Upstream 1. Speaking: Talking about jobs 2. Writing: Spelling: e - the most common letter 3. Language spot: do and does, and wh- questions 4. Vocabulary: Some upstream jobs
Week 5	Downstream 1. Reading: Background 2. Number talk: Calculating 3. Language spot: Present Continuous 4. Vocabulary: Computers and control panels
Week 6	Safety first 1. Reading: Safety signs 2. Number talk: Weights and measures 3. Language spot: Modal verbs: can and must 4. Vocabulary: which kind of word



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Week 7	Mid-term Exam
Week 8	Finding oil and gas 1. Reading: Seismic exploration 2. Writing: Writing sentences 3. Vocabulary: Some science 4. Number talk: Global positioning
Week 9	Drilling 1. Reading: A drilling crew 2. Language spot: Adjective forms 3. Vocabulary: Understanding instructions 4. Speaking: Giving safety advice
Week 10	Working offshore 1. Number talk: Measuring and adjusting variables 2. Reading: A production platform 3. Language spot: Countable and uncountable nouns, Comparative sentences 4. Vocabulary: Electricity and circuits
Week 11	Oil and the environment 1. Writing: An environmental incident report, an informal email asking for information 2. Language spot: Past Simple be 3. Vocabulary: Preventing and dealing with eco-hazards and incidents 4. Reading: Preventing environmental damage
Week 12	Writing technical reports for 1. geology lab 2. drilling lab 3. fluid mechanics lab 4. reservoir engineering lab
Week 13	Punctuation
Week 14	Natural gas 1. Vocabulary: Gas production and distribution 2. Number talk: Talking about a bar chart, line graph, a pie chart
Week 15	The refinery 1. Reading: Fractional distillation 2. Writing: Explaining a process 3. Number talk: Temperature
Week 16	Preparatory week before the final Exam



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Oil and Gas, Level 1 - Lewis Lansford, D'Arcy Vallance	online
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
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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 7

Module Information					
معلومات المادة الدراسية					
Module Title	Engineering Ethics		Module Delivery		
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	ENG 223				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level		2	Semester of Delivery		1
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Jabbar Raheem Rashed		e-mail	dr.jabar72@uomisan.edu.iq	
Module Leader’s Acad. Title		Asst. 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		01/06/2025	Version Number		1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	أهداف المادة الدراسية "أخلاقيات مهنة الهندسة" تتلخص في عدة نقاط رئيسية تهدف إلى تعزيز السلوك المهني والأخلاقي للمهندسين وضمان سلامة المجتمع وجودة العمل



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



أهداف المادة الدراسية	الهندسي، ويمكن تلخيصها كما يلي: ١. التوعية بأهمية الأخلاقيات المهنية في الهندسة ودورها الحيوي في حماية السلامة العامة، خصوصاً في السياق العراقي الذي يحتاج إلى إعادة الإعمار والحفاظ على المال العام. ٢. تعريف الطلاب بمبادئ الأخلاق المهنية، مثل الأمانة، الصدق، الكفاءة، النزاهة، والالتزام بالقوانين والمعايير، وكيفية تطبيقها في الممارسة الهندسية. ٣. تعزيز مسؤولية المهندس تجاه المجتمع وأرباب العمل والزملاء، مع التركيز على حماية الصحة والسلامة العامة والبيئة، وتحقيق التنمية المستدامة. ٤. تدريب المهندسين على اتخاذ قرارات مهنية أخلاقية مستنيرة، مع إدراك المخاطر والتحديات البيئية والاجتماعية، والابتعاد عن السلوكيات غير الأخلاقية مثل الغش، الفساد، وتضارب المصالح. ٥. تطوير مهارات التعامل المهني مع الزملاء وأصحاب المصلحة، بما يشمل التواصل الشفاف، إدارة النزاعات، وحماية سرية المعلومات. ٦. تعزيز الوعي بمسؤولية المهندس القانونية والمهنية، بما في ذلك الالتزام بالعقود، تحمل المسؤولية القانونية، والمساءلة عن الأخطاء المهنية. ٧. تشجيع التطوير المهني المستمر والالتزام بمعايير الجودة والسلامة، مع دعم التعليم المستمر والبحوث العلمية. ٨. بناء "صمام أمان أخلاقي" للمهندس الشاب لمواجهة الضغوط المهنية والتحديات الأخلاقية، من خلال تعزيز قيم الصدق، النزاهة، الشفافية، والتطوير المهني. باختصار، تهدف المادة إلى إعداد مهندسين يتحلون بالقيم الأخلاقية والمهنية، قادرين على تقديم خدمات هندسية ذات جودة عالية، مع حماية المجتمع والبيئة، والالتزام بالقوانين والمعايير المهنية.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	١. يفهم أهمية الأخلاقيات المهنية: إدراك أهمية الأخلاقيات في ضمان سلامة البنية التحتية وحماية المال العام والمصلحة الوطنية، خاصة في السياق العراقي، مع معرفة أن الأخلاقيات ليست فقط بعداً فردياً بل ضرورة وطنية. ٢. يعرف مفهوم الأخلاقيات المهنية: فهم التعريف اللغوي والاصطلاحي للأخلاق المهنية، والتمييز بينهما، وإدراك أن الأخلاق المهنية هي مجموعة القيم والسلوكيات الحسنة التي يجب أن يتحلّى بها المهندس أثناء مزاولة المهنة. ٣. يتعرف على مسؤوليات المهندس وأدواره: مثل حماية الصالح العام، الالتزام بالكفاءة، تجنب تضارب المصالح، المحافظة على سرية المعلومات، التطوير المهني المستمر، والتعامل المهني مع الزملاء والوفاء بالعهود المهنية. ٤. يلتزم بقواعد مدونات الأخلاقيات المهنية: الالتزام بمبادئ النزاهة والكفاءة، تجنب تضارب المصالح، حماية المجتمع والبيئة، والالتزام بالقوانين واللوائح المهنية. ٥. يفهم المسؤولية المهنية والالتزام القانوني: تحمل المسؤوليات القانونية والأخلاقية، التعامل بشفافية ونزاهة، والقيام بواجباته المهنية ضمن حدود كفاءته الفنية. ٦. يعرف كيفية التعامل مع حالات السلوك غير الأخلاقي: مثل التلاعب بنسب الخلطة الخرسانية، قبول



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	الرشوة، أو تجاهل معايير البيئة، وكيفية رفض هذه الممارسات والتبليغ عنه ا. ٧. يطبق مبادئ النزاهة ومكافحة الغش والتزوير: الالتزام بالصدق، منع قبول الهدايا أو العمولات التي تؤثر على قرارات العمل، والإبلاغ عن المخالفات. ٨. يحمي السرية وحفظ المعلومات: احترام سرية المعلومات التقنية والتجارية وعدم استخدامها لمصالح شخصية. ٩. يدير المخاطر والمسؤوليات الأخلاقية: القدرة على اتخاذ قرارات مهنية مسؤولة التنبيه عن المخاطر، والانسحاب من العمل في حالة وجود مخاطر على السلامة. ١٠. يتبنى مواقف أخلاقية قوية عند مواجهة الضغوط المهنية: بناء "صمام أمان أخلاقي" قوي للتمسك بالقيم المهنية والتصرف بنزاهة حتى في الظروف الصعبة.
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	15% (15)	5, 10	LO #1, 2, 10 and 11
	Presentation	1	10% (10)	9	LO # 5, 8 and 10



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	Classwork	1	5% (5)	7	LO # 5, 8 and 10
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مقدمة لأخلاقيات مهنة الهندسة
Week 2	مقدمة من المصادر مدونة البناء العراقية) م.ب.ع. (٠٠٢ وكتاب د. نبيل عبد الرزاق
Week 3	المسؤولية المهنية والالتزام القانوني
Week 4	النزاهة ومكافحة الغش والتزوير في المشاريع الهندسية
Week 5	السلامة العامة والمسؤولية تجاه المجتمع
Week 6	الاستدامة والمسؤولية البيئية
Week 7	تضارب المصالح والشفافية
Week 8	امتحان منتصف الفصل
Week 9	السرية وحماية المعلومات الهندسية
Week 10	مكافحة الفساد والرشوة
Week 11	التوثيق المهني وضمان الجودة
Week 12	التواصل المهني وإدارة أصحاب المصلحة
Week 13	إدارة المخاطر والمسؤوليات الأخلاقية
Week 14	تحليل حالات واقعية لأخلاقيات الهندسة في العراق



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Week 15	المساءلة القانونية وملاحقة الإخلالات المهنية
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1- نبيل عبد الرزاق جاسم Dr. by قواعد وأخلاقيات ممارسة مهنة الهندسة - 1 - دار ومكتبة البصائر، متوفر . ف مكتبات الجامعات العراقية، 2013. 2- نبيل عبد الرزاق جاسم Dr. by قواعد وأخلاقيات ممارسة مهنة الهندسة - 2 - دار ومكتبة البصائر، متوفر . ف مكتبات الجامعات العراقية، 2013. 3-Naagarazan R.S., "A Textbook on Professional Ethics and Human Values", 2006, New Age International (P) Ltd., Publishers, New Delhi, India.	No
Recommended Texts	1-Charles E. Harris, Michael S. Pritchard, Michael J. Rabins, "Engineering Ethics, Concepts and Cases", Fourth Edition, 2009, Wadsworth, USA.	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



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	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.



2-Level II Second Semester

Module 1

Module Information					
معلومات المادة الدراسية					
Module Title	Petroleum Geology		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☐ Seminar		
Module Code	PE 221				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		٢	Semester of Delivery		٢
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Fadhil Kassim Jabbar		e-mail	drfkjabbar@uomisan.edu.iq	
Module Leader’s Acad. Title		An adjunct instructor	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		01/06/2025	Version Number		1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Structural Geology	Semester	1
Co-requisites module	None	Semester	



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Petroleum Geology: The module on Petroleum Geology focuses on the study of subsurface geological formations to identify and evaluate potential oil and gas reservoirs. It combines principles of geology, sedimentology, stratigraphy, and structural geology to understand the origin, distribution, and characteristics of hydrocarbon deposits. This module is designed to describe the different elements and processes that constitute the Petroleum system. The module presents the origin, types and characteristics of source rocks. It Contains the reservoir rocks and their properties to evaluate the reservoir potential prior to exploration and development of petroleum. The hydrocarbon migration and accumulation and entrapment style are also included in this course. The Petroleum Geology module provides students with the necessary knowledge and skills to understand the geological aspects of hydrocarbon exploration and production. By studying the subsurface geology, students can contribute to the identification and development of viable oil and gas reserves, supporting the overall field development and production operations in the petroleum industry.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Two main strands are followed during the course of this module. Firstly, the principal theoretical concepts of petroleum generation, migration, and accumulation, as well as oil exploration are introduced. Sessions each week will consist of lectures to present new theoretical material followed by practical sessions in which to apply various investigative techniques, including; drilling, well log interpretation, well correlation and basin modelling, sequence stratigraphy and seismic interpretation.
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	On successful completion of this module, a student will be expected to be able to: - Understand the history of petroleum and hypothesis of generation - Explain the dynamics of a system to generate and accumulate oil and gas - Evaluate source rock potential and hydrocarbon potentiality - Characterize reservoir rocks, calculate porosity, permeability and saturation - Identify different types of oil traps and how they are formed
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جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	-Visualize the petroleum system in order to identify migration pathways of hydrocarbon and predict the most suitable traps for accumulation - appraise the hydrocarbon potentiality and calculate the reserve in place
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Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4.75
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	1	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	8	16% (16)	Continuous	All
	Report	1	4% (4)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			(100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to petroleum Geology • Overview of the petroleum system • Origin of Petroleum



Week 2	Methods of Petroleum Exploration	
	- Geophysical and Geochemical Methods - Borehole Geophysics and 4D Seismic - Subsurface Geology and Remote Sensing - Formation Evaluation - Subsurface Geological Mapping	
Week 3	Generation of Petroleum	
	- Production of Organic Matter - Accumulation of Organic Matter	
Week 4	Formation of Kerogen	
	- Stages of Transformation of Organic Matter - Diagenesis, Catagenesis, Metagenesis - Types of Kerogen - Quiz	
Week 5	Petroleum Source Rocks	
	- Total Organic Carbon (TOC) - Thermal Maturation and Thermal maturation indicators - Types of Thermal Maturity Modeling	
Week 6	The Reservoir Rocks	
	- Porosity and Permeability - Capillary Pressure and Multi-phase fluid flows - Wettability and Wettability Index and Measurements - Texture of Reservoir Rocks	
Week 7	The Reservoir Rocks	
	- Effects of Diagenesis on Reservoir Quality - Hydrostatic/Lithostatic pressure gradient - Reservoir Rock Compressibility - Reservoir Continuity - Reservoir Characterization	
Week 8	The Reservoir Rocks	
	- Reserve Calculation - Production Methods - Quiz	
Week 9	Petroleum Migration and Accumulation	
	- Phases of Petroleum Migration - Mechanisms of Petroleum Migration - Primary migration and Secondary migration	
Week 10	Hydrocarbon Traps and Seals	
	- Elements of a Hydrocarbon Trap - Types of Hydrocarbon Traps	
Week 11	Hydrocarbon Traps and Seals	
	- Distribution of Petroleum within a Trap - Types of Hydrocarbon Traps in Iraq - Seals and Cap Rocks	



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	Quiz
Week 12	Sedimentary Basins & Petroleum Systems - Basic Concepts - Mechanisms of Basin Formation - Classification of Sedimentary Basins
Week 13	Sedimentary Basins & Petroleum Systems - Distribution of Hydrocarbons in different types of basins - Basins and Petroleum System - Sedimentary Basins and Petroleum system of Iraq
Week 14	Physical & Chemical Properties of Petroleum - Characteristics of Crude Oil - Natural Gases
Week 15	Final Project and Exam Preparation Completion of a Petroleum Geology project Exam preparation and review
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Lithostratigraphic Correlation
Week 2	Lab 2: Well Log Correlation
Week 3	Lab 3: Overview of Seismic Stratigraphy and Interpretation
Week 4	Lab 4: Direct Hydrocarbon Indicator (DHI) Mapping
Week 5	Lab 5: Modeling Source Generation and Analyzing a potential source rock
Week 6	Lab 6: Generating an Isochron Map
Week 7	Lab 7: Fault Seal Analysis and Hydrocarbon Charge

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<i>Elements of Petroleum Geology</i> , 2nd ed., Richard Selley (Academic Press, 2nd edition 1998; 3rd edition 2014)	No



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Recommended Texts	<i>The Petroleum Geology of Iraq</i>, A. A. M. Aqrabi, J. C. Goff, A. D. Horbury and F. N. Sadooni, ISBN: 978-0-901360-36-8 424 pages <i>Petroleum Geology</i>, North F. K., 1985, Allen & Unwin Publishing. Very good reference book on petroleum geology overall. Excellent examples, especially for the North Sea <i>Sedimentary Basins and Petroleum Geology of the Middle East</i>, 1997, A.S. Alsharhan, A.E.M. Nairn	No
Websites	https://www. https://wiki.aapg.org/Main_Page	

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

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Module 2

Module Information					
معلومات المادة الدراسية					
Module Title	MATHEMATICS IV		Module Delivery		
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	ENG 202				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		2	Semester of Delivery		2
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Ali AL-MALIKI		e-mail	ali.al-maliki@uomisan.edu.iq	
Module Leader's Acad. Title		Assist.Lec.	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		01/06/2025	Version Number		1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Mathematics III	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Be educated on Mathematics methods. 2. Know the procedure of calculations. 3. Develop students understanding of useful Mathematics methods in engineering calculations.



	4. Studying and solve applications using Mathematics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The main outcome is a student have the knowledge of useful mathematics methods makes him deal with the problems, applications and calculations in different branches of science in Petroleum engineering
Indicative Contents المحتويات الإرشادية	

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 examples and exercises, while at the same time refining and expanding their logical thinking skills. This will be achieved through classes, interactive tutorials and by considering solving of simple applications.
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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	62	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	3	15% (15)	5, 8, 14	All
	Class Assignments	2	10% (10)	6, 11	All
	Homework	2	10% (10)	3, 13	All
	Report	1	5% (5)	9	All



Summative assessment	Midterm Exam	1 hr	10% (10)	7	All
	Final Exam	3 hr	50% (50)	15	All
Total assessment			(100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Chapter One: PARTIAL DERIVATIVES - Functions of Several Variables - Graphing a Function of Two Variables - Partial Derivatives
Week 2	Chapter One: PARTIAL DERIVATIVES - Second Order Partial Derivatives - The Chain Rule
Week 3	Chapter One: PARTIAL DERIVATIVES - Directional Derivatives and Gradient Vectors - Homework
Week 4	Chapter One: PARTIAL DERIVATIVES - Gradients and Tangents to Level Curves - Functions of Three Variables
Week 5	Chapter One: PARTIAL DERIVATIVES - Extreme Values and Saddle Points - Quiz.
Week 6	Chapter One: PARTIAL DERIVATIVES - Lagrange Multipliers - Assignment
Week 7	Chapter Four: MULTIPLE INTEGRALS - Double and Iterated Integrals over Rectangles - Double Integrals over General Regions
Week 8	Chapter Four: MULTIPLE INTEGRALS - Finding Limits of Integration - Properties of Double Integrals - Area by Double Integration



	Quiz
Week 9	Chapter Two: MULTIPLE INTEGRALS - Double Integrals in Polar Coordinates - Finding Limits of Integration - Area in Polar Coordinates - Changing Cartesian Integrals into Polar Integrals
Week 10	Chapter Two: MULTIPLE INTEGRALS - Triple Integrals - Midterm.
Week 11	Chapter Three: INFINITE SEQUENCES AND SERIES - Introduction, Convergence and Divergence Test - Assignment
Week 12	Chapter Three: DIFFERENTIAL EQUATIONS - Fundamental Definitions - Solutions of First Order: variable separable - Solutions of First Order: exact
Week 13	Chapter Three DIFFERENTIAL EQUATIONS - Solutions of First Order: linear - Solutions of First Order: Bernoulli - Homework
Week 14	Chapter Three: DIFFERENTIAL EQUATIONS - Introduction to Solutions of second Order: Linear equation with constant coefficients, linear homogeneous equations with constant coefficients - Quiz.
Week 15	Chapter Three: DIFFERENTIAL EQUATIONS Introduction to Solutions of second Order: nonhomogeneous equations, solving of non-homogenous equations, variation of parameters
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	George B. Thomas, Maurice D. Weir, Joel Hass, Frank R. Giordano - Thomas's calculus	



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Recommended Texts	1. H.K. Dass - Advanced Engineering Mathematics-S Chand & Co Ltd (2007)	
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.				



Module 3

Module Information					
معلومات المادة الدراسية					
Module Title	Fundamentals of Petroleum Engineering		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	PE 222				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		2	Semester of Delivery		2
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Ali Nooruldeen Abdulkareem		e-mail	ali.nooruldeen@uomisan.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		Master
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		01/06/2025	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 aims provide a broad overview of the intended learning outcomes for the course, which aim to equip students with a solid foundation in petroleum engineering principles, techniques, and industry practices.



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Module Learning Outcomes مخرجات التعلم للمادة الدراسية	These module learning outcomes reflect the desired knowledge, skills, and competencies that students should develop throughout the course in order to become competent petroleum engineering professionals.
Indicative Contents المحتويات الإرشادية	The indicative contents provide an overview of the key topics and areas of study that would be covered in a course on petroleum engineering. The specific depth of coverage and additional subtopics can be tailored based on the course duration and desired learning outcomes.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	In a course on petroleum engineering, various strategies can be implemented to enhance student learning and engagement. Here are some strategies that can be employed: Active Learning: Incorporate active learning strategies such as problem-based learning, case studies, group discussions, and hands-on exercises. This allows students to apply their knowledge, solve problems, and engage with the material actively. Practical Assignments: Assign practical projects and assignments that simulate real-world petroleum engineering tasks. This can include reservoir simulation exercises, well design projects, or data analysis from well logs and production data. By implementing these strategies, educators can create an engaging and comprehensive learning environment for students studying petroleum engineering. By implementing these strategies, educators can create an engaging and comprehensive learning environment for students studying petroleum engineering.
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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	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.25
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		



Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20% (20)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	presentation	1	5% (5)	4	LO # 3, 4, 6 and 7
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	- Introduction to Petroleum Engineering - Elements of petroleum engineering - Overview of the oil and gas industry - Origin of petroleum and formation of hydrocarbon reservoirs
Week 2	- Reservoir Rock Properties and Fluid Distribution - Rock properties: porosity, permeability, and lithology - Fluid distribution within reservoirs - Saturation calculations and reservoir characterization
Week 3	- Volumetric Calculations of Oil in Place - Estimating hydrocarbon reserves - Material balance equations and calculations - Introduction to reservoir simulation concepts
Week 4	- Natural Forces in Oil and Gas Reservoirs - Reservoir pressure and temperature considerations - Fluid flow mechanisms: Darcy's law and fluid displacement - Capillary pressure and relative permeability
Week 5	Oil Exploration Methods and Techniques



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	- Geologic surveys and mapping - Seismic exploration and interpretation - Well log analysis for prospect evaluation - Quiz
Week 6	- Week 6: Rotary Drilling Principles and Techniques - Drilling rig components and their functions - Drilling fluids and their properties - Drilling bits and their selection
Week 7	- Casing Design and Installation - Casing types and sizes - Casing design considerations - Casing installation techniques and procedures
Week 8	- Cementing Operations - Cementing objectives and principles - Cementing materials and additives - Cementing process and quality control
Week 9	- Well Completion Techniques and Equipment - Wellhead equipment and its functions - Tubing and packer installation - Perforation techniques and considerations
Week 10	- Introduction to Well Logging - Well logging principles and objectives - Open-hole logging tools and interpretation - Logging while drilling (LWD) techniques - Quiz
Week 11	- Wireline Logging Tools and Interpretation - Introduction to wireline logging - Logging tool functions and measurements - Interpretation of logging data for formation evaluation
Week 12	- Formation Evaluation and Reservoir Characterization - Rock properties determination from logging data - Petrophysical analysis and interpretation - Reservoir characterization techniques
Week 13	- Artificial Lift Methods - Principles and types of artificial lift - Pumping systems: sucker rod pumps, electric submersible pumps (ESPs) - Gas lift systems and optimization - Report due
Week 14	- Field Development Planning and Case Studies - Reservoir management principles - Field development planning considerations - Case studies from Iraqi oil fields or other relevant examples
Week 15	Final Project and Exam Preparation



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	- Completion of the project - Exam preparation and review
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	<u>Tarek Ahmed - Fundamentals of Reservoir Engineering:</u> يعد المرجع الأهم لفهم أساسيات	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.



Module 4

Module Information					
معلومات المادة الدراسية					
Module Title	Computer and Artificial Intelligence		Module Delivery		
Module Type	Basic		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	ENG 127				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level		2	Semester of Delivery		٢
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Ali Dhahir		e-mail	ali_dh11@uomisan.edu.iq	
Module Leader's Acad. Title		Asst. Professor	Module Leader's Qualification		Master
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		01/06/2025	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	التعرف على البرامج المستخدمة لكتابة الاكواد بلغة C++ والماتلاب التعرف على اساسيات لغة C++ والماتلاب كيفية كتابة الجمل الشرطية وانواع الاوامر لتنفيذها التعرف على العمليات التكرارية واهم الاوامر المستخدمة في التكرار
أهداف المادة الدراسية	



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Module Learning Outcomes مخرجات التعلم للمادة الدراسية	١- تنصيب البرنامج الخاص بكتابة الكود C++ وبرنامج الماتلاب MATLAB ٢- معرفة الاساسيات وكيفية استدعاء المتغيرات ونوع البيانات التي يتم ادراجها ٣- معرفة استخدام الجمل الشرطية وتطبيق البرامج الخاصة بها ٤- معرفة كيفية تكرار تنفيذ الايعازات لبي انات متعددة والاوامر المستخدمة في التكرار ٥- التعرف على بعض الايعازات ذات استخدام محدد لتنفيذ امر ٦- التعرف على المكتبات المستخدمة والغرض من استدعاءها ٧- التعرف على كيفية تنفيذ العمليات المنطقية والرياضية ٨- التعرف على كيفية الرسم في برنامج الماتلاب
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	الطريقة الألقائية الطريقة الحوارية الطريقة الناشطة (تعتمد على نشاط الطالب)

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	12	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	.75
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية	
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جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



		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.	7	14% (14)	Continuous	All
	Report	1	6% (6)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Install program of C++ & Basics of C++
Week 2	Arithmetic and logic operations & Input/Output program
Week 3	Stdio library & Public and private variables
Week 4	If condition & Nested if
Week 5	Loops (for)
Week 6	Loops (while) & Nested loops
Week 7	Install program of MATLAB
Week 8	Arithmetic and logic operations
Week 9	Input/Output functions
Week 10	If condition & Nested if
Week 11	Loops (for)
Week 12	Loops (while) & Nested loops
Week 13	2d plot
Week 14	3d plot
Week 15	Preparatory week before the final Exam



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Install program of C++ & Basics of C++
Week 2	apply some examples on Arithmetic and logic operations & Input/Output program
Week 3	Stdio library & Public and private variables
Week 4	If condition & Nested if
Week 5	Loops (for)
Week 6	Loops (while) & Nested loops
Week 7	Writing through the editor or script
Week 8	Arithmetic and logic operations
Week 9	Input/Output functions
Week 10	If condition & Nested if
Week 11	Loops (for)
Week 12	Loops (while) & Nested loops
Week 13	2d plot
Week 14	3d plot
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1 C++ # موسوعة البرمجة بلغة C++ # البرمجة بلغة	Yes



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	مع الأمثلة والتمارين	
Recommended Texts	# C++ How to program/ Paul Deitel, Harvey Deitel	No
Websites	يمكن الولوج الى صفحة الموضوع او من خلال موقع الكلية www.uomisan.edu.iq/moodle Video Portal Main Page - MATLAB & Simulink (mathworks.com)	

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 5

Module Information				
معلومات المادة الدراسية				
Module Title	Fluid Mechanics II - Dynamic		Module Delivery	
Module Type	B		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	PE 224			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level		2		
Administering Department		Petroleum Eng.	College	Engineering College
Module Leader	Saad Hanon		e-mail	saadhanoon82@gmail.com
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	01/06/2025		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. Introduce the principles of viscous flow in pipes. 2. Define the Reynold's number to introduce the laminar flow and turbulent flow 3. Introduce Moody chart 4. Introduce pumps and pumps connection. 5. Dimensional Analysis 6. Multiphase flow
Module Learning Outcomes	7. Be able to know the type of flow 8. Be able to derive the velocity profile and shear stress distribution in pipes 9. Calculate frictional losses in pipe problems for both laminar and turbulent flows, by using Moody Diagram.



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



مخرجات التعلم للمادة الدراسية	10. Calculate secondary (minor) losses for various pipes fittings and connections. 11. Be able to analyze and design pumping stations and connection 12. Be able to use of The Rayleigh Method in dimensional analysis 13. Apply the Buckingham pi theorem and develop a set of dimensionless variables for a given flow situation. 14. Discuss the use of dimensionless variables in data analysis. 15. Be able to apply modern knowledge and to apply mathematics, science, engineering and technology to fluid mechanics problems and applications. 16. Be able to understand the fundamental two-phase flow.
Indicative Contents المحتويات الإرشادية	Laminar and Turbulent Flows Reynolds Number, The Entrance Region, Entry Lengths Laminar Flow in Pipes, Pressure Drop and Head Loss, Effect of Gravity on Velocity and Flow Rate in Laminar Flow, Laminar Flow in Noncircular Pipes, Turbulent Flow, The Moody Chart, Major Losses, Minor Losses Dimensional Analysis, The Rayleigh Method, Buckingham Pi Theorem, Determination of Pi Terms, Some Additional Comments About Dimensional Analysis, Flow of multiphase mixtures, Properties of multiphase mixtures, The continuity equation for multiphase mixtures, The momentum equation for multiphase mixtures

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Fluid mechanics is an important area of study in physics and engineering. There are several learning and teaching strategies that instructors can use to help facilitate student understanding of this complex topic. Here are a few: Hands-on experience: One of the best ways to learn about fluid mechanics is through hands-on experiences. Students can conduct experiments, work on projects, and participate in simulations that allow them to directly see the principles of fluid mechanics in action. Visual aids: Another effective teaching strategy is the use of visual aids such as animations, diagrams, and videos. These can help to illustrate complex concepts in a more easily understandable way. Active learning: Active learning strategies, such as group work and problem-based learning, can help students to better understand fluid mechanics by encouraging them to interact with the material and each other. Real-world examples: Using real-world examples can be a very effective teaching strategy in fluid mechanics. Students can better understand how these principles are applied in real life and this can help to increase their engagement and understanding. Concept mapping: Concept mapping is a teaching strategy where students create visual representations of their understanding of a particular topic. This can be particularly effective in
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جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	fluid mechanics as it can help students to better understand the relationships between different concepts
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.75
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	8	16% (16)	Continuous	All
	Report	1	4% (4)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduce the principles of viscous flow in pipes.
Week 2	Define Reynolds Number to know the laminar and turbulent flow



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Week 3	The Entrance Region, Entry Lengths Laminar Flow in Pipes,
Week 4	Pressure Drop and Head Loss, Effect of Gravity on Velocity and Flow Rate in Laminar Flow
Week 5	Laminar Flow in Noncircular Pipes, Turbulent Flow, The Moody Chart,
Week 6	Major Losses, Minor Losses
Week 7	Mid-term Exam
Week 8	Dimensional Analysis
Week 9	The Rayleigh Method,
Week 10	Buckingham Pi Theorem
Week 11	Determination of Pi Terms Some Additional Comments About Dimensional Analysis
Week 12	Flow of multiphase mixtures
Week 13	Properties of multiphase mixtures
Week 14	The continuity equation for multiphase mixtures
Week 15	The momentum equation for multiphase mixtures
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Fluid properties
Week 2	Lab 2: Dead weight calibrated
Week 3	Lab 3: Manometers
Week 4	Lab 4: Visualization of the flow in the channels
Week 5	Lab 5: Pitot static tube
Week 6	Lab 6: Bernoulli's Theorem Demonstration
Week 7	Lab 7: Reynolds number



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamentals of Fluid Mechanics by Munson	Online
Recommended Texts		Online
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.



Module 6

Module Information					
معلومات المادة الدراسية					
Module Title	Arabic Language 2		Module Delivery		
Module Type	Basic		☐ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	UOM 203				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		2	Semester of Delivery		2
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Mohammed Abdhussain Mohammed		e-mail	moh.albahadli@uomisan.edu.iq	
Module Leader's Acad. Title		Assist. Lec.	Module Leader's Qualification		Msc
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		01/06/2025	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	ان الهدف من تدريس مادة اللغة العربية في هذا القسم هو الكفاءة اللغوية للطلبة وتمكينهم من التعبير عن أفكارهم ومشاريعهم بلغة عربية فصيحة واضحة خالية من الغلط واللون العامي والاعجمي بأبسط الطرق.



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	فاللغة هي أداة الاتصال الأولى بين أفراد المجتمع، ومتى تمكن الإنسان من لغته استطاع الوصول الى أذهان الآخرين بحيث يسهل تعامله معهم ويتمكن من تحقيق هدفه في العمل. وان ذلك يؤدي الى تحقيق التوازن المفترض في ثقافة الطلبة فهو يضمن نوعاً من التعادل بين مناهج المادة العلمية ووسيلة إيصالها او التعبير عنها.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	أ- الاهداف المعرفية • يتعلم الطالب خلال الفصل الدراسي بعض اساسيات مادة اللغة العربية • فهم تاريخ واساسيات نشأ قواعد اللغة العربية. • يتعلم كيفية كتابة تقرير او بحث او طلب اجازة بدون اخطاء لغوية او كتابية . • يتعلم الطالب كيفية كتابة الانشاء ومنها الى طريقة كتابة التقارير والبحوث العلمية. ب- الاهداف المهاراتية الخاصة بالموضوع جعل الطالب قادرا على: ١ - يتعلم كيفية كتابة انواع الهمزة سواء كانت همزة قطع او وصل وكيفية لفظها ٢- يتعلم نبذة عن كتابة الهمزة سواء على الالف او الياء او الواو او مفردة على السطر ٣- يفرق بين الظاء والضاد ٤- يفرق بين التاء المربوطة والتاء
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	١- تمكين الطلبة من كتابة التقارير حول المواضيع الخاصة بجميع المواد وصياغتها بعيدا عن الاخطاء اللغوية ٢- تمكين الطلبة من كيفية استخدام المفردات الصحيحة وذلك من خلال الرجوع للقواميس ٣- رفع ثقة الطالب بنفسه من خلال خوض بعض المحادثات والمناظرات اللغوية ولا سيما الشعرية منها ٤- تنمية مهارات الطلبة في كيفية التعامل مع مشاكل اللغة على الصعيدين اللفظي والكتابي وكيفية التعامل معها

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1
Total SWL (h/sem)	50		



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



الحمل الدراسي الكلي للطالب خلال الفصل

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2 and 12	LO # 3, 4, 6 and 7
	Presentation	1	10% (10)	9	LO # 3, 4, 6 and 7
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	قواعد اللغة العربية : الكلام وما يتألف منه : الاسم ، والفعل والحرف الفعل واقسامه ، عالماته ، الفعل الماضي قواعد فعل الأمر ، الحرف وما يتميز به
Week 2	الفعل واقسامه ، عالماته ، الفعل الماضي
Week 3	قواعد فعل الأمر ، الحرف وما يتميز به
Week 4	الأعراب والبناء ، وعالماته الأعراب ، والمثنى والملحق به
Week 5	ادب ، ونص شعري ، ودراسة وتحليل جمع المذكر السالم / والملحق به
Week 6	الملحقة بالأسماء الستة
Week 7	امتحان نصف الفصل
Week 8	المبتدأ والخبر ، انواع المبتدأ واحكامه
Week 9	قواعد : الخبر ، تعريفه وانواعه اختبار يومي
Week 10	أملأ : قواعد كتابه الهمزة
Week 11	ادب : نص نثري . دراسة وتحليل



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Week 12	قواعد : اغلاط لغوية شائعة
Week 13	أملاء : قواعد كتابه الألف في نهاية الكلمة
Week 14	محاضرة عامه ومناقشات
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	شرح ابن عقيل على الفية ابن مالك . بيروت دار الكتب العامة ١٩٨٥ ، تحقيق محي الدين عبد الحميد	Yes
Recommended Texts	جامع الدروس العربية . بيروت دار الكتب العلمية ١٩٨٤ . ١٩٨٧ ، تأليف مصطفى - الغلايني - اللغة العربية لغير أقسام الاختصاص . مؤسسه دار الكتب بغداد ١٩٨١ ، تأليف عبد القادر حسين أمين . والدكتور رشيد العبيدي محاضرات في اللغة العربية . جامعه بغداد ، تأليف الدكتور علاء الدين الخفاجي	
	اللغة العربية لغير أقسام الاختصاص . مؤسسه دار الكتب بغداد ١٩٨١ ، تأليف عبد القادر حسين أمين . والدكتور رشيد العبيدي	
	النحو التطبيقي. دار اللؤلؤة ٢٠١٨ ، خالد عبد العزيز .	
	جميع المجالات العلمية الرصينة التي لها علاقة باللغة العربية	
	المراجع الالكترونية , مواقع الانترنت	
	أي مواد أخرى متاحة على شبكة الإنترنت	
Websites		



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



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 7

Module Information					
معلومات المادة الدراسية					
Module Title	جرائم البعث			Module Delivery	
Module Type	Basic			☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MNS 120				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		٢	Semester of Delivery		2
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Muaid Kareem		e-mail	mwydkrym203@gmail.com	
Module Leader’s Acad. Title		Asst. teacher	Module Leader’s Qualification		Msc.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		01/06/2025	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



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Module Aims أهداف المادة الدراسية	للتعرف والاطلاع على مجموعة من الجرائم التي ارتكبتها حزب البعث البائد والمنحل بحق أبناء الشعب العراقي ومن مختلف المكونات لأطيافه ولتأسيس وعي للطلبة لرفض جميع اشكال الظلم والتسلط لهذه الأنظمة والمطالبة بجميع الحقوق المدنية والسياسية
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	١-تعرف الطالب على جرائم البعث وفق قانون المحكمة الجنائية العراقية،
Indicative Contents المحتويات الإرشادية	للتعرف على القرارات الصادرة من المحكمة الجنائية

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	اللقاء المحاضرات واستخدام طريقة النقاش والحوار

Student Workload (SWL) الحمل الدراسي للطلبة محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلبة خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلبة أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلبة خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلبة أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطلبة خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	8,4	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	10,6	LO # 3, 4, 6 and 7
	Presentation	1	10% (10)	9	LO # 5, 8 and 10
	Report	1	10% (10)	14	LO # 5, 8 and 10



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة مسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	مفهوم وتعريف الجرائم وأقسامها
Week 2	تعريف الجريمة لغة واصطلاحاً
Week 3	موقف قانون المحكمة الجنائية العليا لسنة ٢٠٠٥ من انتهاكات نظام البعث وأهم القرارات الصادرة عنها
Week 4	انواع الجرائم الدولية
Week 5	دور نظام البعث في الانتهاكات النفسية وأثارها المترتبة عليها
Week 6	دور نظام البعث في الانتهاكات الاجتماعية وأثارها المترتبة عليها
Week 7	موقف نظام البعث من الدين والمؤسسات الدينية
Week 8	دور نظام البعث بانتهاك القوانين الخاصة بحقوق الانسان
Week 9	امتحان نصف الفصل
Week 10	انتهاكات نظام البعث السياسية والعسكرية
Week 11	انتهاكات نظام البعث للبيئة في العراق / التلوث الحربي
Week 12	انتهاكات نظام البعث للبيئة في العراق/ تدمير المدن والقرى
Week 13	انتهاكات نظام البعث للبيئة في العراق/تجفيف الاهوار والبساتين
Week 14	التكليف القانوني والشرعي لجريمة المقابر الجماعية
Week 15	دور نظام البعث في احداث المقابر الجماعية في العراق



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	جرائم نظام البعث في العراق	yes
Recommended Texts	أرشيف مؤسسة السجناء السياسيين	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.



3- Level III

First semester

Module 1

Module Information					
معلومات المادة الدراسية					
Module Title	Petroleum Reservoir Engineering I		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☐ Seminar		
Module Code	PE 311				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		3	Semester of Delivery		1
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Saif Ali Qasim		e-mail	Saif.aliq@uonmisan.edu.iq	
Module Leader’s Acad. Title		Assist. lec	Module Leader’s Qualification		M.S.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		01/06/2025	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 is to provide students with a comprehensive understanding of the properties and behavior of reservoir rocks. This includes studying rock properties such as porosity, permeability, saturation, wettability, capillary pressure, and relative permeability. By gaining a deep understanding of these properties, students will be able to analyze and predict the behavior of fluids within the reservoir, which is essential for making informed decisions about the extraction of oil and gas.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Overall, the course's learning outcomes equip students with the necessary knowledge, skills, and tools to analyze, characterize, and optimize reservoir performance based on rock properties. They will be well-prepared to tackle real-world reservoir engineering challenges and contribute to the efficient and sustainable extraction of hydrocarbon resources.
Indicative Contents المحتويات الإرشادية	

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.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.85
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		



Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	8	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to reservoir engineering. - Introduction about reservoir rocks and reservoir fluids. - Introduction core analysis and how to obtain representative core material.
Week 2	Porosity - Types and classification of porosity - Parameters that influence porosity - Laboratory measurement of porosity - Averaging of Porosity
Week 3	Absolute Permeability - Darcy's Law - Heterogeneity, An Isotropy, And Permeability Tensor - Averaging Of Permeabilities
Week 4	Absolute Permeability - Laboratory Measurement of Absolute Permeability - Factors Affecting Absolute Permeability
Week 5	Fluid Saturation Distribution of fluid saturation in a petroleum reservoir



	- Reservoir Rock Samples Used for Fluid Saturation Determination. - Assessing the validity of fluid saturation data measured on the plug-end trim for the core plug sample.
Week 6	Fluid Saturation - Special types of fluid saturations. - Saturation averaging. - Factors affecting fluid saturation determination. - Skin factor derivation.
Week 7	Wettability - Introduction - Interfacial and surface tension. - Wettability - Fundamental concepts of wettability - Discussion on practical aspects of wettability
Week 8	Wettability - measurement of reservoir rock wettability - Factors affecting wettability. - Relationship between wettability and irreducible water saturation and residual oil saturation - Quiz about absolute Saturation
Week 9	Capillary pressure - Introduction - Excess Pressure Inside Curved Surface - The basic mathematical expression of capillary pressure - The rise of liquid in capillaries and the plateau equation - Quiz about wettability
Week 10	Capillary pressure - Dependence of capillary pressure on rock and fluid properties - Capillary pressure and saturation history - Laboratory measurement of capillary pressure. - Converting laboratory capillary pressure data to reservoir conditions - Characteristics of capillary pressure curves
Week 11	Capillary pressure Averaging capillary pressure: j function



	- Effect of wettability on capillary pressure - Practical application of capillary pressure - Zonation, fluid contacts, and initial saturation distribution in a reservoir
Week 12	Relative permeability. - Factors Affecting Relative Permeability - Steady-State Technique measurements - Quiz about Capillary pressure
Week 13	Relative permeability Unsteady-State Technique
Week 14	Relative permeability - Capillary End Effect - Determination of relative permeability from capillary pressure data - Factors Affecting Relative Permeability Measurements - Peculiarities of relative permeability data - Assessing the validity of relative permeability data and determination of Corey exponents - Significance of Relative Permeability Data - Three Phase Relative Permeabilities
Week 15	Final Submission of problems and exercises - Solving the problems and the exercises using one of the following - MATLAB, Mathcad, or Excel
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Helium porosimeter
Week 2	Lab 2: Vacuum Saturation
Week 3	Lab 3: Permeability measurement using Gas.
Week 4	Lab 4: Retort Distillation and Dean-Stark Extraction
Week 5	Lab 5: Mercury Injection Method and Centrifuge Method
Week 6	Lab 6: CONTACT ANGLE MEASUREMENT and Amott Test or USBM Method
Week 7	Lab 7: relative permeability steady state technique and unsteady state technique



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Abhijit Y. Dandekar 2013 "Petroleum Reservoir Rock and Fluid Properties" Tarik Ahmed 2019 "Reservoir Engineering Handbook, 5th edition" Tom Blasingame lectures and lecture note	Yes
Recommended Texts	Professor Tom Blasingame Lectures and contributions (Directory Listing (tamu.edu)) Advanced Mathematics for Engineers and Scientists, M.R. Spiegel, Schaum's Series (1971). [The 1st edition, the 1971 text.]	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 (فيد 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 2

Module Information					
معلومات المادة الدراسية					
Module Title	Drilling Engineering I		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	PE 312				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		3	Semester of Delivery		1
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Ahmed K. Abbas		e-mail	Ahmed.Abbas@uomisan.edu.iq	
Module Leader's Acad. Title		Lect.	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		01/06/2025	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 Drilling Engineering Module is designed to provide students with an in-depth understanding of the principles and techniques involved in drilling oil wells. The



	module covers various aspects of drilling wells, including drilling fluids, including mixing and analysis of rheological properties; drilling hydraulics, drill bit selection, casing design; well cementing; pore pressure and geomechanical considerations in drilling; introduction to directional drilling and deviated wells.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The purpose of the course is to learn the how to conduct fundamental tasks in well design and drilling operations. The lab specifically deals with the preparation, analysis and properties of fluids used in the drilling of oil and gas wells. Specific course objectives are: 1. Learn the basic components used in drilling and the rig system. 2. Develop casing program, design casing based on pore pressure and fracture gradient and cementing program and understand requirements to protect fresh water. Select casing strings based on burst, collapse, tension. 3. Understand basic methods to select, rig size, BOP ratings, drilling bit, bottom hole assemblies. 4. Maintain well control by calculating mud weight necessary to maintain well control and understand how mud additives can be used to prevent kick and improve hole cleaning. 5. Be introduced to technologies and tools for directional drilling. 6. Know basic fishing tool types and applications. In addition, the lab are to instruct students on: (1) the primary functions of oilfield drilling fluids; (2) the procedures to measure drilling fluids and cement properties; (3) the common additives used to obtain the desirable properties under various well conditions; (4) the main factors controlling mud selection; and (5) training students on report writing skills.
Indicative Contents المحتويات الإرشادية	

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.
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جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.85
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	5, 10	LO #1, 2, 10 and 11
	Class Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	7	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview of the Drilling Process, Rigs and Rig systems.
Week 2	Wellbore Elements and Volumes



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Week 3	Hydrostatic pressures in the wellbore and subsurface
Week 4	Drilling Fluids, I
Week 5	Drilling Fluids, II Quiz
Week 6	Safe Mud weight window - Pore Pressure
Week 7	Safe Mud weight window - Fracture gradients
Week 8	Casing design, I
Week 9	Casing design, II Quiz
Week 10	Cements
Week 11	Cementing Procedures Quiz
Week 12	Casing design, collapse, burst, tensile, I
Week 13	Casing design, II
Week 14	Roller Cone and Drag drilling bits
Week 15	PDC drilling bits Quiz

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Well schematics with I-Handbook™, Lab safety
Week 2	Lab 2: Basic drilling fluid properties
Week 3	Lab 3: Sand content
Week 4	Lab 4: Fluid Loss A
Week 5	Lab 5: Fluid Loss B
Week 6	Lab 6: Weighted mud
Week 7	Lab 7: Rig systems



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Applied Drilling Engineering, Textbook Vol. 2 Authors: A.T. Bourgoyne Jr., K.K. Millheim, M.E. Chenevert	Yes
Recommended Texts	Fundamentals of Drilling Engineering. SPE Textbook Series, Vol 12, Authors: R.F. Mitchell and S.Z Miska	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

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Module 3

Module Information					
معلومات المادة الدراسية					
Module Title	Production Engineering, I		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	PE ٣١٣				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		3	Semester of Delivery		1
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Mohammed Abdul Ameer		e-mail	dr.alhumairi@uomisan.edu.iq	
Module Leader's Acad. Title		Asst. 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		01/06/2025	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	
	The aim of the production engineering module in the third grade of the petroleum engineering department is to provide students with a comprehensive understanding of the principles and practices involved in the production of oil and gas. The module



Module Aims أهداف المادة الدراسية	focuses on developing students' knowledge and skills related to the design, optimization, and management of oil and gas production systems. Well Completion and Stimulation: Students will gain knowledge of well completion techniques and stimulation methods. This includes understanding different types of well completions, hydraulic fracturing, and acidizing. Field Development Planning: Students will gain an understanding of field development planning processes. They will learn how to evaluate reservoir potential, estimate recoverable reserves, and design production strategies for optimal field development.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Understand the fundamental principles of production engineering: Students should be able to demonstrate a comprehensive understanding of the basic principles and concepts of production engineering, including reservoir characteristics, fluid flow, well completion, and artificial lift methods. Analyze and interpret production data: Students should be able to collect and analyze production data from oil and gas wells, interpret the results, and identify potential production issues or opportunities for optimization. Design well completions: Students should be able to design and optimize well completions, considering factors such as reservoir characteristics, wellbore stability, and production objectives. They should also be able to evaluate different completion techniques and select the most appropriate ones for specific reservoir conditions. Evaluate and select artificial lift methods: Students should be able to assess different artificial lift methods, including gas lift, sucker rod pumps, electric submersible pumps (ESPs), and hydraulic pumps. They should be able to analyze well performance and reservoir characteristics to select the most suitable artificial lift method for maximizing production. Identify and troubleshoot production problems: Students should be able to identify common production problems, such as scaling, sand production, and wax deposition, and propose effective solutions to mitigate or eliminate these issues. They should also be familiar with troubleshooting techniques to address equipment failures or operational challenges. Understand production optimization techniques: Students should be aware of various production optimization techniques, such as well stimulation, hydraulic fracturing, and workover operations. They should be able to evaluate the potential benefits and limitations of these techniques and apply them to enhance production rates and ultimate recovery. Apply health, safety, and environmental practices: Students should demonstrate a strong commitment to health, safety, and environmental practices in the production engineering field. They should be aware of relevant regulations and industry standards and



	incorporate them into their decision-making process to ensure safe and environmentally responsible operations. Communicate effectively: Students should be able to communicate technical concepts, analysis results, and recommendations effectively, both orally and in written form. They should be able to present their findings and ideas to both technical and non-technical audiences, demonstrating clarity, coherence, and professionalism.
Indicative Contents المحتويات الإرشادية	Introduction to Production Engineering: Overview of production engineering in the petroleum industry, its importance, and its role in maximizing hydrocarbon recovery. Reservoir Fluid Properties: Understanding the behavior of reservoir fluids, including oil, gas, and water, their physical properties, phase behavior, and their impact on production. Well Performance: Analyzing the performance of oil and gas wells, studying inflow and outflow performance relationships, wellbore flow, and pressure behavior. Well Completion: Techniques and technologies for completing and optimizing oil and gas wells, including completion design, perforation strategies, and well stimulation. Artificial Lift Systems: Introduction to artificial lift methods, such as rod pumping, gas lift, and electric submersible pumps (ESP), and their application in enhancing production from oil and gas wells. Wellbore Hydraulics: Understanding the fluid flow behavior in wellbores, pressure drop calculations, and optimization of production rates through proper design and selection of tubing and flow control equipment. Production Facilities: Introduction to surface production facilities, including separators, storage tanks, pumps, compressors, and pipelines, and their role in the processing and transportation of hydrocarbons. Production Optimization: Techniques for optimizing production rates and enhancing hydrocarbon recovery, such as nodal analysis, artificial lift optimization, water and gas injection strategies, and reservoir management. Well Surveillance and Production Monitoring: Methods for monitoring well performance, data acquisition, analysis, and interpretation, and the use of surveillance tools to diagnose and troubleshoot production issues. Production Forecasting: Introduction to production forecasting techniques, decline curve analysis, material balance, and numerical simulation for predicting future production rates and reservoir behavior.



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	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	١٢٥		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10, 13	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Classwork	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Type of well – total production system and its component
Week 2	Types of completion single, dual, triple zones (advantage and disadvantage of each of the completion)
Week 3	Gathering line on the surface, and Types of storage tanks, requirement and definition.
Week 4	Separator definition, Separator types and classification, Separator and the separation mechanism, the effect on separation mechanism
Week 5	Separator sizing and calculation of each phase area.
Week 6	Conning definition and different methods to calculate the critical flow
Week 7	Choke performance, type of chokes, importance of choke for production practice.
Week 8	Different methods to calculate the choke performance (Gilbert and Ros).
Week 9	Introduction to well stimulation, types of well stimulation.
Week 10	Hydraulic fracture and its calculation (dimension of hydraulic fracture)
Week 11	Drill Stem Test: introduction to well test, requirement to well test.
Week 12	Calculation of permeability (k), skin factor(S), initial pressure (Pi) and pressure drop due to skin.
Week 13	Practice to calculate different parameters from DST
Week 14	Final Project and Exam Preparation Completion of a well test project
Week 15	Exam preparation and review
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.



Module 4

Module Information					
معلومات المادة الدراسية					
Module Title	Well Logging I		Module Delivery		
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☒ Seminar		
Module Code	PE 314				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		3	Semester of Delivery		1
Administering Department		Petroleum Eng.	College	Engineering college	
Module Leader	Abo Alhasan Ali Mahfodh		e-mail	abu.al.hassan@uomisan.edu.iq	
Module Leader’s Acad. Title		Lect.	Module Leader’s Qualification		Master
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		17/06/2025	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 Objectives أهداف المادة الدراسية	- To develop problem solving skills and understanding of well logging through the application of techniques. - gives insights into the role of borehole measurements in the search for and evaluation of hydrocarbon reservoirs - The module covers a number of measurement methods, and how these are used to determine important rock parameters such as porosity, permeability, water saturation and the rock types along the borehole. - This module deals with the fundamental petrophysical concepts and equations. How does the composition of the rock influence the measurements we do and important petrophysical parameters like porosity, permeability and saturation. - This is the most important log measurements used in boreholes: Resistivity,



	natural gamma radiation, neutron porosity, density, photoelectric absorption, acoustic measurements, formation pressures, nuclear magnetic resonance and more. - The measurement environment in a borehole and environmental corrections of the data. - Find how the measured properties can be used to determine the porosity, permeability, water/hydrocarbon saturation, shale content and rock type.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Know the logging operations and data acquisition for logging while drilling and open hole logging. - Know the physics of various logging tools. - Describe different rock properties such as porosity, permeability and saturation based on basic definition. - Interpret individual and combination of wire-line log data for lithology and fluids - Interpret different wire-line log data by cross-plotting - Estimate hydrocarbon volume in the reservoir based on reservoir properties - Know the main applications and limitations of the different measurements - Perform a quick qualitative interpretation to determine possible interest zones - The students are expected to understand and to make simple interpretations of the more common log measurements that are made in a borehole. They should be able to determine the main lithologies and estimates of porosity, saturation and permeability, and which fluid types, water, oil or gas, are present in the formations. - As a general competence: During group work the students learn to cooperate and to take responsibility for their part of the assignments given. By working with real data from the field, they learn to understand that real data can be uncertain and that one has to use common sense and understanding in order to find good answers to the interpretation problems.
Indicative Contents المحتويات الإرشادية	This course is a "must have" for anyone working with the subsurface within the petroleum industry. Well logging provides data to answer fundamental questions regarding petrophysical, geological and mechanical properties required to evaluate, develop and produce a field. The course covers The fundamental rock properties and petrophysical concepts and equations. The following well logging measurements are discussed: SP log, gamma ray log, Caliper log, conventional resistivity log, induction log; lateral log, macro resistivity log, acoustic/sonic log, density log, photoelectric absorption, neutron porosity, nuclear magnetic resonance, TDT log, CBL log and quick method in (HC) detection. Further topics include the measurement environment, geometrical considerations in a borehole, environmental corrections, and the link between the measured parameters and the rock's porosity, permeability, fluid/gas saturation, lithology and clay content. Through exercises and projects, the students will learn how to interpret well log data. During group work the students learn to cooperate and to take responsibility for their part of the assignments given. By working with real data from the field, they learn to understand that real data can be uncertain and that one has to use common sense and understanding in order to find good answers to the interpretation problems.



Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Teaching/Learning Strategies include:
	1- Direct Instruction in classroom, 4 hrs per week. 2- Classroom Discussions 3- Group Design Projects 4- Seminars Methods of assessment for students. 1- Compulsory exercises 2- Quarterly exams. 3- Discussions and assignments for project. *The overall assessment for this course is as follows: Annual pursuit of 30 points from the total mark, which includes assignments, oral examinations and quarterly in addition to presentations. *70 marks for the final exam

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	1.25
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	3	10% (10)	5, 9, 13	LO #1, #2 and #10, #11
	Assignments	1	10% (10)	12	LO #3, #4 and #6, #7
	Projects	1	10% (10)	14	LO #3, #4 and #6, #7
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Week 2,3	Basic rock properties, petrophysics
Week 4	Sp log
Week 5	GR log
Week 6	Caliper log
Week 7,8, 9	conventional resistivity log, induction log; lateral log, macro resistivity log
Week 10,11,12	Porosity log: sonic log, density log, neutron log
Week 13	Well log analysis - Overview of permeability and calculations for sedimentary rocks
Week 14	Shaly formation interpretation, and Shaly sand saturation versus Archie equation
Week 15	Quick-Look methods for determining the presence of hydrocarbons

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Theory, Measurement, and Interpretation of Well Logs " Bassiouni , McGraw-Hill Education	Yes
Recommended Texts	1-Basic well log analysis 2- Open Hole Wireline Logging 3- Wireline Logging operations	Yes
Websites	None	

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 5

Module Information					
معلومات المادة الدراسية					
Module Title	Engineering Analysis I		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	PE 315				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		3	Semester of Delivery		1
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Sabah Falah		e-mail	sabahalhamdi@uomisan.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		17/06/2025	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 Objectives أهداف المادة الدراسية	This module is intended to expose the students to understand the basic ideas of differential equations (DE) combined with its definition, types, orders, and degrees. It provides a comprehensive understanding of solving differential equations with 1st order and nth order using different approaches. This module is a fundamental module that provides students with the mathematical skills and knowledge necessary for solving engineering problems in the petroleum industry. It covers a range of mathematical concepts and techniques applicable to various engineering disciplines, including petroleum engineering. Engineering Analysis Module (I) provides students with a solid foundation in mathematical principles and problem-solving techniques necessary for



Module Learning Outcomes مخرجات التعلم للمادة الدراسية	understanding and analyzing complex engineering problems in petroleum engineering. At the end of this module, students will be able to: 1- Understand the fundamentals of differential equations. 2- Classify the differential equations based on its type, order, and degree. This will help to identify the best method for solving the differential equations. 3- Solve the 1st order of DE using different methods including separable, exact, homogenous, linear, Bernoulli, and Ricatti's methods. 4- Apply of 1st DE for solving different physical problems including Cooling Problems, Falling Bodies, Growth and Decay, and Dilution Problems. 5- Solve the nth order of LDE with constant coefficients using two methods: Undetermined Coefficients and Variation of Parameters. Then, applying that on Spring-Mass System. 6- Solve the 2nd DE with variable coefficient using different methods such as Power-series method, Tayler, Frobenius, and Bessel's function methods.
Indicative Contents المحتويات الإرشادية	The Module of Engineering Analysis I is an important course to understand the fundamentals of differential of differential equations and how it can be solved. It covers various aspects and applications of differential equations. It can help students to learn how to translate the physical problems into differential equations which can be then solved based on the initial and boundary conditions of this DE. This model will also deeply help the students to understand the numerical methods which can be used for simulating the reservoir

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 discussion in class and quick quizzes. This will be achieved through classes, interactive tutorials and by considering a simple type of strategy involving some examples related to petroleum industry that have been solved and understood using differential equations. * Lectures are conducted by face-to-face education in the classroom, two hours per week, and students' technical reports. * Conducting dialogues and discussions with the request. Methods of assessment for students. * Quarterly exams. * Discussions and assignments. *The overall assessment for this course is as follows: Annual pursuit of 30 points from the total mark, which includes quizzes, assignments in addition to presentation. *70 marks for the final exam



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



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	2.25
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	Quiz	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Class Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Presentation	1	10% (10)	9	LO #3, #4 and #6, #7
	HomeWork	1	10% (10)	13	LO #3, #4 and #6, #7
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 and LO #7
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Ordinary Differential Equations: Review of Fundamental Concepts
Week 2, 3	1 ST Order Linear Differential Equations: Types and Solutions
Week 4,5	Application of 1 ST Order Linear Differential Equations
Week 6,7	Solution of nth order of LDE using Undetermined Coefficients
Week 8	Solution of Nth order of LDE using Variation of Parameters



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Week 9	Solution of Linear Differential Equations with Variable Coefficients/ Cauchy-Euler Method
Week 10,11	Solution of 2 nd Order DE with variable coefficients using Power-Series Method
Week 12	Solution of 2 nd Order DE with variable coefficients using Tayler-Series Method
Week 13, 14	Solution of 2 nd Order DE with variable coefficients using Frobenius Method/ Three Cases
Week 15	Preparation and Help Session for the Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Curriculum and textbook	Yes
Recommended Texts	- Engineering Mathematics", by John Bird, 5th edition, Elsevier Ltd., 2007 - Advanced Engineering Mathematics", by Peter V. O'Neil, 7th Edition, Cengage Learning, 2012	Yes
Websites	None	

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 6

Module Information				
معلومات المادة الدراسية				
Module Title	Petroleum Eng. Economics		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	PE 316			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level	3	Semester of Delivery		
Administering Department		Type Dept. PE	College	E
Module Leader	Ryadh Tuma		e-mail	ryadtuma@uomisan.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		01/06/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Production engineering & reservoirs Eng	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	basic petroleum and Gas concepts & Oil Economic concepts and conversion standards and transactions - its composition Oil formation theories Types of oil The economic functions of oil. To achieve the required understanding by students of economic concepts associated with the oil industry.
Module Learning Outcomes	A This material of study will be increasing the level of knowledge and skills to evaluate the required aspects of economics as part of petroleum and gas industries. The study of analysis the economics tools will helps determine level of investments and risks related



مخرجات التعلم للمادة الدراسية	with oil-fields. Accuracy and integration of information with practical reality will be one of the most important outputs that reflect the current and future economic outlook in the oil industry or the optimal use of this industry in other supporting industries. Accuracy in presenting examples and the standard of economic analysis and evaluation will be a major part of this study stage.
Indicative Contents المحتويات الإرشادية	NA

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. Using pdf and ppt format during the course of study will be main tools within different level of exercises and solved problem.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.75
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

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	1	10% (10)	Continuous	All



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Overview petroleum and gas Functions of petroleum economics. Importance of petroleum Economics & Characteristics of the oil industry
Week 2	Economic aspects for Oil and gas reserve. organization of petroleum exporting and importing countries
Week 3	International supply and demand of petroleum. classification of petroleum,
Week 4	petroleum pricing, alternative energy, international strategy of energy, Alternative energy, international strategy of energy,
Week 5	Time value of money, Quiz
Week 6	Types of interest rates, Mid Exam
Week 7	Investments Evaluations, NET PRESENT VALUE, NPV, IRR, MIRR etc. & Hurdle and minimum acceptable rates of return profitability Index
Week 8	NPV, IRR, MIRR etc. & Hurdle and minimum acceptable rates of return profitability Index, Distinguishing cash flow from income and profit
Week 9	Sources of revenue and cost & lifecycle costing, Cost classifications & relationship between costs and revenue
Week 10	Break Even Analysis, risk analysis production decline curves,
Week 11	Decision models, game theory, Risk adjustments when valuing petroleum reserve Categories, Sensitivity analysis of engineering projects.
Week 12	Sensitivity analysis of engineering projects, Applications of Sensitivity analysis of engineering projects, Quiz
Week 13	methods of engineering decisions, depreciation methods, depreciation methods



Week 14	taxation, inflation, Bidding process and re-awarded contracts and Future production of oil and gas wells, Bidding process and re-awarded contracts and Future production of oil and gas wells
Week 15	Paybacks methods
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamentals of economic concepts in oil and gas	Yes
Recommended Texts		No
Websites	https://www.coursera.org/browse/Economic_petrolmoe	

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

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Module 7

Module Information					
معلومات المادة الدراسية					
Module Title	Engineering Statistics		Module Delivery		
Module Type	Basic		☒ Theory ☒ Lecture ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	PE 317				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		3	Semester of Delivery		1
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Zahara Rasool		e-mail	geologist_2021@uomisan.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		17/06/2025	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 Objectives أهداف المادة الدراسية	1. Understanding Statistical Concepts: Introduce students to the fundamental concepts of statistics, such as measures of central tendency, dispersion, probability, and statistical distributions. This provides a solid foundation for further statistical analysis. 2. Data Collection and Analysis: Teach students how to collect, organize, and



	analyze data using appropriate statistical methods and techniques. This includes graphical representation of data, calculation of descriptive statistics, and interpretation of results. 3. Probability and Probability Distributions: Cover the principles of probability theory and the use of probability distributions in engineering applications. Students should learn about discrete and continuous probability distributions, including the binomial, Poisson, and normal distributions. 4. Hypothesis Testing: Familiarize students with the concept of hypothesis testing and its application in engineering. This involves understanding null and alternative hypotheses, selecting appropriate test statistics, determining significance levels, and drawing conclusions based on test results. 5. Regression Analysis: Introduce students to regression analysis, which is widely used in petroleum engineering for modeling and predicting various parameters. Teach them about simple linear regression, multiple regression, and the interpretation of regression coefficients. 6. Design of Experiments: Provide an overview of experimental design principles, including the concept of randomization, control groups, factorial designs, and statistical inference in experiments. This helps students understand how to plan and conduct experiments effectively. 7. Reliability and Quality Control: Explore statistical methods for analyzing reliability and maintaining quality control in petroleum engineering processes. Students should learn about failure analysis, reliability estimation, control charts, and process capability analysis. 8. Statistical Software: Familiarize students with statistical software packages commonly used in engineering, such as R or Python. Teach them how to perform statistical analysis, generate plots, and interpret results using these tools. 9. Real-world Applications: Illustrate the application of statistics in petroleum engineering through relevant case studies and examples. This helps students understand how statistical methods are utilized in areas like reservoir characterization, production optimization, and risk analysis. 10. Critical Thinking and Communication: Develop students' critical thinking skills by encouraging them to evaluate and interpret statistical results critically. Emphasize effective communication of statistical findings through written reports and presentations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the fundamental concepts of statistics, including measures of central tendency, dispersion, probability, and distributions. 2. Apply statistical techniques to analyze and interpret data relevant to petroleum engineering, such as reservoir properties, production rates, and well performance. 3. Evaluate and select appropriate statistical methods for solving engineering problems in the petroleum industry.



	4. Use statistical software tools effectively to analyze large datasets and perform statistical calculations. 5. Apply hypothesis testing techniques to make decisions and draw conclusions about petroleum engineering processes and data. 6. Demonstrate proficiency in regression analysis and its application in modeling and predicting petroleum engineering phenomena. 7. Understand the principles of experimental design and be able to design and analyze experiments to optimize petroleum engineering processes. 8. Interpret and communicate statistical results effectively through technical reports and presentations. 9. Recognize the limitations and assumptions associated with statistical methods and their application in petroleum engineering. 10. Develop critical thinking skills to assess the reliability and validity of statistical analyses and make informed decisions based on statistical evidence in the petroleum industry.
Indicative Contents المحتويات الإرشادية	1. Introduction to Statistics: • Basic concepts and terminology • Data types and measurement scales • Descriptive statistics: measures of central tendency and dispersion 2. Probability Theory: • Introduction to probability • Basic probability rules and axioms • Conditional probability and independence • Probability distributions: discrete and continuous 3. Random Variables and Probability Distributions: • Random variables and their properties • Probability mass functions (PMFs) and probability density functions (PDFs) • Common probability distributions in engineering: • Binomial distribution • Poisson distribution • Normal distribution • Exponential distribution 4. Sampling and Estimation: • Sampling techniques and sample design • Sampling distributions • Point estimation and properties of estimators • Confidence intervals 5. Hypothesis Testing: • Null and alternative hypotheses • Type I and Type II errors • Common test statistics: • Z-test



	• t-test • Chi-square test 6. Regression Analysis: • Simple linear regression • Multiple linear regression • Model fitting and interpretation • Residual analysis 7. Design of Experiments: • Basics of experimental design • Factorial designs • Randomized block designs • Analysis of variance (ANOVA) 8. Quality Control: • Statistical process control (SPC) • Control charts • Process capability analysis 9. Reliability and Life Testing: • Reliability concepts • Failure distributions • Life testing experiments 10. Case Studies and Applications: • Real-world engineering applications of statistical analysis • Use of statistical software tools for data analysis
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1. Actively participate in class: Attend all lectures and actively engage in discussions. Ask questions, seek clarification, and participate in class activities. This will help you understand the concepts better and reinforce your learning. 2. Review prerequisite knowledge: Make sure you have a solid understanding of the prerequisite mathematical concepts, such as calculus and probability theory. If you find any gaps in your knowledge, review the necessary topics before diving into Engineering Statistics. 3. Establish a study schedule: Create a study schedule that allocates dedicated time for studying Engineering Statistics. Break down the topics into manageable chunks and allocate sufficient time for practice problems and review.
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4. Practice regularly: Engineering Statistics is best learned through practice. Solve a wide range of problems to reinforce your understanding of concepts and improve your problem-solving skills. Use the textbook, online resources, and additional problem sets provided by your instructor.
5. Seek additional resources: If you find certain topics challenging or need further explanation, don't hesitate to seek additional resources. Look for online tutorials, video lectures, or supplementary textbooks that offer alternative explanations or examples.
6. Form study groups: Collaborate with classmates and form study groups. Explaining concepts to others and discussing problem-solving strategies can enhance your understanding and provide different perspectives. You can also share resources and learn from each other's strengths.
7. Utilize office hours: Attend your instructor's office hours or seek help from teaching assistants if you have specific questions or need extra guidance. They can clarify doubts and provide further insight into challenging topics.
8. Review and revise regularly: Don't leave your studying until the last minute. Regularly review and revise the material covered in class to reinforce your understanding and retention of key concepts.
9. Use software tools: Familiarize yourself with software tools commonly used in Engineering Statistics, such as Excel, MATLAB, or statistical software like R or Python. These tools can help you analyze data, perform statistical calculations, and visualize results.
10. Connect theory with real-life applications: As a petroleum engineering student, try to relate the statistical concepts you learn in class to real-life scenarios in your field. Understanding the practical applications of Engineering Statistics can make the subject more engaging and relevant.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.15
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	Quiz	2	10% (10)	5 and 9	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	4 and 11	LO #3, #4 and #6, #7
	Presentation	1	5% (5)	13	LO #3, #4 and #6, #7
	Project	1	15% (15)	14	LO #3, #4 and #6, #7
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 and LO #7
	Final Exam	3hr	70% (70)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Oil and gas reserve, organization of petroleum exporting and importing countries,
Week 2	International supply and demand of petroleum,
Week 2, 3	Classification of petroleum, petroleum pricing, alternative energy, international strategy of energy,
Week 4,5	Time value of money, types of interest rates, rate of return,
Week 6,7	Methods of engineering decisions, depreciation, depletion, amortization, taxation, inflation, and quiz.
Week 8,9	Sensitivity analysis of engineering projects,
Week 9	Mid exam
Week 10,11	Risk analysis production decline curves,
Week 12,13	Evaluation of future production of oil and gas wells.
Week 14	Exam preparation and review
Week 15	Preparatory week before the final Exam



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Curriculum and textbook	Yes
Recommended Texts	- Engineering Mathematics”, by John Bird, 5th edition, Elsevier Ltd., 2007 - Advanced Engineering Mathematics”, by Peter V. O’Neil, 7th Edition, Cengage Learning, 2012	Yes
Websites	None	

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.



Level III

Second Semester

Module 1

Module Information					
معلومات المادة الدراسية					
Module Title	Petroleum Reservoir Engineering II			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☐ Seminar	
Module Code	PE 321				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		3	Semester of Delivery		
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Saif Ali Qasim		e-mail	Saif.aliq@uonmisan.edu.iq	
Module Leader's Acad. Title		Assist. lec	Module Leader's Qualification		M.S.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		01/06/2025	Version Number		1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Reservoir Engineering I	Semester	1
Co-requisites module	None	Semester	



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	The aim of the reservoir engineering course is to provide students with a comprehensive understanding of key concepts in petroleum reservoir engineering. This course focuses on fluid properties, phase behavior, PVT (Pressure-Volume-Temperature) sampling, compositional analysis of reservoir fluids, PVT analysis, and properties of formation waters. By the end of the course, students will have a solid foundation in these areas, enabling them to accurately characterize reservoirs, predict fluid behavior, and make informed decisions for efficient reservoir management.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	students should have a comprehensive understanding of the behavior and characteristics of fluids in petroleum reservoirs. They should be able to apply this knowledge to analyze and interpret PVT data, conduct compositional analysis of reservoir fluids, and make predictions about reservoir performance. Additionally, students should understand the principles of vapor-liquid equilibria and their application in reservoir engineering, as well as the impact of formation waters on reservoir performance. This knowledge will equip them with the skills necessary to make informed decisions about the development and management of oil and gas fields.
Indicative Contents المحتويات الإرشادية	

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.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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



Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	7	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Petroleum Reservoir Fluids • Introduction • Chemistry of petroleum • Solid components of petroleum • Classification of reservoir gases and oils • Five reservoir fluids • Other hydrocarbon fluids of interest • Formation waters
Week 2	Introduction to Phase Behavior • Introduction • Definition of terms used in phase behavior. • Phase behavior of a pure component • Phase behavior of two-component • Phase behavior of multicomponent mixtures • Construction of phase envelopes
Week 3	Phase Behavior of Petroleum Reservoir Fluids • Introduction • Preamble to the phase behavior of petroleum reservoir fluids • Brief description of the plus fraction • Classification and identification of fluid type



	• Black oils • Volatile oils • Gas condensates • Wet gases • Dry gases • Behavior of petroleum reservoir fluids in the two-phase region • Saturated hydrocarbon reservoirs • Production trends of five reservoir fluids
Week 4	PVT sampling • Introduction • Practical considerations of fluid sampling • Methods of fluid sampling • Evaluating the representativity of fluid samples: quality checks • Factors affecting sample representativity
Week 5	Compositional Analysis of Petroleum Reservoir Fluids • Introduction • Strategy of compositional analysis • Characteristics of reservoir fluid composition • Gas chromatography • True boiling-point distillation • Characterization of pseudo fractions and residue
Week 6	PVT Analysis and Reservoir Fluid Properties • Introduction • Properties of gases and liquid • Properties of Ideal gas • Properties of real gas • Properties of mixture of gases
Week 7	PVT Analysis and Reservoir Fluid Properties • Properties of black oil and volatile oil
Week 8	PVT Analysis and Reservoir Fluid Properties • PVT Laboratory tests • PVT Equipment • Constant Composition Expansion • Differential Liberation • Constant Volume Depletion • Separator Tests
Week 9	PVT Analysis and Reservoir Fluid Properties • Adjustment of Black Oil Laboratory Data • Other sources of obtaining the properties of petroleum reservoir fluids
Week 10	Vapor-Liquid Equilibria • Introduction • Ideal mixtures • Empirical correlations for calculating equilibrium ratios for real solutions
Week 11	Vapor-Liquid Equilibria • IEQUATIONS-OF-STATE (EOS) MODELS • Use of EOS Models in PVT Packages
Week 12	Properties of Formation of Waters • Compositional characteristics of formation waters



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	- Bubble-point pressure of formation water - Formation volume factor of formation water - Density of formation water - Viscosity of formation water - Solubility of hydrocarbons in formation water - Solubility of formation water in hydrocarbons - Compressibility of formation water
Week 13	Material balance Introduction to Material balance equation and its most common features
Week 14	The continuity equation - Introduction to the derivation of the continuity equation and its uses for the two common coordinate system which are the cylindrical and the rectangular - The Linearization of the equation and the analytical solution and the uses of it in PTA and RTA - Introduction to the numerical solution of the continuity equation through the implementation of finite difference methods.
Week 15	Final Submission of problems and exercises - Solving the problems and the exercises using one of the following - MATLAB, Mathcad, or Excel

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Construction of Phase Envelopes
Week 2	Lab 2: Gas Chromatography
Week 3	Lab 3: True Boiling-Point Distillation
Week 4	Lab 4: Constant Composition Expansion
Week 5	Lab 5: Differential Liberation
Week 6	Lab 6: Constant Volume Depletion
Week 7	Lab 7: Separator Tests

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Abhijit Y. Dandekar 2013 "Petroleum Reservoir Rock and Fluid Properties" Tarik Ahmed 2019 "Reservoir Engineering Handbook, 5th	Yes



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



	edition” Tom Blasingame lectures and lecture note	
Recommended Texts	Professor Tom Blasingame Lectures and contributions (Directory Listing (tamu.edu)) Advanced Mathematics for Engineers and Scientists, M.R. Spiegel, Schaum's Series (1971). [The 1st edition, the 1971 text.]	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.				



Module 2

Module Information					
معلومات المادة الدراسية					
Module Title	Drilling Engineering II		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	PE 322				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		3	Semester of Delivery		2
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Ahmed K. Abbas		e-mail	Ahmed.Abbas@uomisan.edu.iq	
Module Leader's Acad. Title		Lect.	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		01/06/2025	Version Number		1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Drilling Engineering I	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The Drilling Engineering Module is designed to provide students with an in-depth understanding of the principles and techniques involved in drilling oil wells. The module covers various aspects of drilling wells, including drilling fluids, including mixing and analysis of rheological properties; drilling hydraulics, drill bit selection, casing design; well cementing; pore pressure and geomechanically considerations in drilling; introduction to directional drilling and deviated wells.
Module Learning Outcomes	The purpose of the course is to learn the how to conduct fundamental tasks in well design and drilling operations. The lab specifically deals with the preparation, analysis



مخرجات التعلم للمادة الدراسية	and properties of fluids used in the drilling of oil and gas wells. Specific course objectives are: 1. Learn the basic components used in drilling and the rig system. 2. Develop casing program, design casing based on pore pressure and fracture gradient and cementing program and understand requirements to protect fresh water. Select casing strings based on burst, collapse, tension. 3. Understand basic methods to select, rig size, BOP ratings, drilling bit, bottom hole assemblies. 4. Maintain well control by calculating mud weight necessary to maintain well control and understand how mud additives can be used to prevent kick and improve hole cleaning. 5. Be introduced to technologies and tools for directional drilling. 6. Know basic fishing tool types and applications. In addition, the lab are to instruct students on: (1) the primary functions of oilfield drilling fluids; (2) the procedures to measure drilling fluids and cement properties; (3) the common additives used to obtain the desirable properties under various well conditions; (4) the main factors controlling mud selection; and (5) training students on report writing skills.
Indicative Contents المحتويات الإرشادية	

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



Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Class Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	8	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	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Wellbore Stability & Drilling Problems, I
Week 2	Wellbore Stability & Drilling Problems, II Quiz
Week 3	Drilling Cost Analysis, II
Week 4	Drilling Cost Analysis, II Quiz
Week 5	Drill stem design, I
Week 6	Drill stem design, I
Week 7	Drill stem design, III Quiz
Week 8	Drilling Hydraulics
Week 9	Drilling Hydraulics - Pressure drop calculations Quiz



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Week 10	Well Control – Kick, I
Week 11	Well Control – Kick, II Quiz
Week 12	Introduction to Directional Drilling, II
Week 13	Introduction to Directional Drilling, II Quiz
Week 14	Introduction to offshore drilling
Week 15	Well problems and Fishing tools and practices
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Rig systems
Week 2	Lab 2: Drilling bits A
Week 3	Lab 3: Drilling bits B
Week 4	Lab 4: Kick
Week 5	Lab 5: Cement design
Week 6	Lab 6: Lab demonstration
Week 7	Lab 7: Well design

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Applied Drilling Engineering, Textbook Vol. 2 Authors: A.T. Bourgoyne Jr., K.K. Millheim, M.E. Chenevert	Yes
Recommended Texts	Fundamentals of Drilling Engineering. SPE Textbook Series, Vol 12, Authors: R.F. Mitchell and S.Z Miska	yes
Websites		



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



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
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	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 3

Module Information					
معلومات المادة الدراسية					
Module Title	Production Engineering II		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	PE 323				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3	Semester of Delivery			2
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Mohammed Abdul Ameer		e-mail	dr.alhumairi@uomisan.edu.iq	
Module Leader's Acad. Title		Asst. 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		01/06/2025	Version Number		1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Production engineering, I	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The aim of the production engineering module in the third grade of the petroleum engineering department is to provide students with a comprehensive understanding of the principles and practices involved in the production of oil and gas. The module focuses on developing students' knowledge and skills related to the design, optimization, and management of oil and gas production systems.



	Stimulation: Students will gain knowledge of well stimulation methods. This includes understanding different types of well completions, hydraulic fracturing, and acidizing. Artificial Lift Systems: Students will be introduced to artificial lift methods used to enhance the production rate of oil and gas wells. They will learn about different types of artificial lift systems, including rod pumping, gas lift, and electrical submersible pumps. Throughout the module, students will also develop practical skills through hands-on exercises, case studies, and simulation exercises. The aim is to equip students with the necessary knowledge and skills to contribute effectively to the production operations in the petroleum industry.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Understand the fundamental principles of production engineering: Students should be able to demonstrate a comprehensive understanding of the basic principles and concepts of production engineering, including reservoir characteristics, fluid flow, well completion, and artificial lift methods. Analyze and interpret production data: Students should be able to collect and analyze production data from oil and gas wells, interpret the results, and identify potential production issues or opportunities for optimization. Design well completions: Students should be able to design and optimize well completions, considering factors such as reservoir characteristics, wellbore stability, and production objectives. They should also be able to evaluate different completion techniques and select the most appropriate ones for specific reservoir conditions. Evaluate and select artificial lift methods: Students should be able to assess different artificial lift methods, including gas lift, sucker rod pumps, electric submersible pumps (ESPs), and hydraulic pumps. They should be able to analyze well performance and reservoir characteristics to select the most suitable artificial lift method for maximizing production. Identify and troubleshoot production problems: Students should be able to identify common production problems, such as scaling, sand production, and wax deposition, and propose effective solutions to mitigate or eliminate these issues. They should also be familiar with troubleshooting techniques to address equipment failures or operational challenges. Understand production optimization techniques: Students should be aware of various production optimization techniques, such as well stimulation, hydraulic fracturing, and workover operations. They should be able to evaluate the potential benefits and limitations of these techniques and apply them to enhance production rates and ultimate recovery. Apply health, safety, and environmental practices: Students should demonstrate a strong commitment to health, safety, and environmental practices in the production engineering field. They should be aware of relevant regulations and industry standards and incorporate them into their decision-making process to ensure safe and environmentally responsible operations. Communicate effectively: Students should be able to communicate technical concepts, analysis results, and recommendations effectively, both orally and in written form. They



	should be able to present their findings and ideas to both technical and non-technical audiences, demonstrating clarity, coherence, and professionalism.
Indicative Contents المحتويات الإرشادية	Introduction to Production Engineering: Overview of production engineering in the petroleum industry, its importance, and its role in maximizing hydrocarbon recovery. Reservoir Fluid Properties: Understanding the behavior of reservoir fluids, including oil, gas, and water, their physical properties, phase behavior, and their impact on production. Well Performance: Analyzing the performance of oil and gas wells, studying inflow and outflow performance relationships, wellbore flow, and pressure behavior. Well Completion: Techniques and technologies for completing and optimizing oil and gas wells, including completion design, perforation strategies, and well stimulation. Artificial Lift Systems: Introduction to artificial lift methods, such as rod pumping, gas lift, and electric submersible pumps (ESP), and their application in enhancing production from oil and gas wells. Wellbore Hydraulics: Understanding the fluid flow behavior in wellbores, pressure drop calculations, and optimization of production rates through proper design and selection of tubing and flow control equipment. Production Facilities: Introduction to surface production facilities, including separators, storage tanks, pumps, compressors, and pipelines, and their role in the processing and transportation of hydrocarbons. Production Optimization: Techniques for optimizing production rates and enhancing hydrocarbon recovery, such as nodal analysis, artificial lift optimization, water and gas injection strategies, and reservoir management. Well Surveillance and Production Monitoring: Methods for monitoring well performance, data acquisition, analysis, and interpretation, and the use of surveillance tools to diagnose and troubleshoot production issues. Production Forecasting: Introduction to production forecasting techniques, decline curve analysis, material balance, and numerical simulation for predicting future production rates and reservoir behavior.

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.
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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	62	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	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Review of production engineering 1 and total production system.
Week 2	Inflow performance relationship (IPR): introduction, definition and explain the different cases
Week 3	Straight line IPR and the requirement to draw the IPR straight line
Week 4	Two phase IPR and the requirement to draw the IPR curve.
Week 5	Using Vogel's chart to construct IPR.
Week 6	Using standing chart to construct IPR.
Week 7	Application to use Vogel's, and standing charts to construct IPR.
Week 8	Construct combination IPR, by different methods.
Week 9	Vertical flow performance (VFP): introduction, definition and explain the different cases. Define the working chart, using working chart.
Week 10	Practice to use the working charts
Week 11	Artificial lift: methods, requirement for each method
Week 12	Gas lift, design and calculation.



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة ميسان
بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



Week 13	Electrical submersible pump, ESP, design and calculation.
Week 14	Final Project Completion of a production engineering 1 project.
Week 15	Exam preparation and review
Week 16	Preparatory week before the final Exam

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	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	



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
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أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
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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 4

Module Information				
معلومات المادة الدراسية				
Module Title	Well Logging II		Module Delivery	
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	PE 324			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	3	Semester of Delivery		
Administering Department		Petroleum Eng.	College	Engineering college
Module Leader	Abo Alhasan Ali Mahfodh		e-mail	abu.al.hassan@uomisan.edu.iq
Module Leader’s Acad. Title		Lect.	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	17/06/2025		Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Well Logging I	Semester	1
Co-requisites module	none	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1- To introduce students to the principles and applications of advanced well logging and Production Logging Techniques such as NMR, FMI, CBL, PLT, and (PNL) pulsed neutron logs.



	- To provide insights into the importance of modern borehole measurements in evaluating dynamic reservoir behavior and well performance. - The module covers advanced measurement methods and their use in determining rock and fluid properties such as porosity, permeability, saturation, and fracture networks. - This module deals with modern petrophysical interpretation techniques, including NMR physics, dielectric responses, and borehole imaging fundamentals. - The most important advanced and Production log measurements covered in this course include: nuclear magnetic resonance (NMR), borehole imaging (FMI/EMI), cement bond logs (CBL/VDL), production logging tools (PLT) and pulsed neutron measurements. - The course addresses measurement conditions in open and cased holes, including borehole effects, completion interference, and environmental corrections for modern tools. - Students will learn how advanced logging data can be used to interpret porosity types, permeability trends, bound vs. free fluids, hydrocarbon saturation, rock fabric, and fluid mobility. - The course also emphasizes integration of advanced logs with conventional logs and core data to build a comprehensive formation evaluation model. - Students will handle real field datasets and apply interpretation workflows using software platforms such as Techlog or Interactive Petrophysics. - Through group-based case studies and field examples, students will develop practical skills in analyzing uncertain data and forming justified conclusions in complex reservoir scenarios.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Explain the operating principles and physical fundamentals of advanced and Production well logging tools, including NMR, FMI/EMI, CBL, PLT, and pulsed neutron tools. - Describe the significance and applications of advanced borehole measurements in understanding reservoir dynamics and wellbore performance under both open and cased hole conditions. - Identify and interpret petrophysical properties such as porosity types, permeability, fluid saturation, fracture systems, and fluid mobility using data from advanced logs. - Analyze NMR logs to distinguish between free and bound fluids and estimate permeability using T1/T2 distributions and relaxation times. - Interpret borehole imaging logs (e.g., FMI) to identify natural fractures, stratification, breakouts, and borehole geometry features critical to structural and geomechanical analysis. - Evaluate cement bond log (CBL/VDL) data to assess cement integrity, casing-to-formation bonding, and wellbore completion quality. - Use production logging tools (PLT) to analyze downhole flow profiles, zonal contributions, and detect crossflows or completion inefficiencies. - Integrate advanced log data with conventional logs and core measurements to construct a complete reservoir model with improved accuracy and reliability.
Indicative Contents المحتويات الإرشادية	This course is essential for petroleum engineers, petrophysicists, and geoscientists aiming to deepen their understanding of advanced well logging technologies and their applications in formation evaluation and reservoir monitoring. Advanced logging tools



	provide high-resolution data critical for characterizing complex reservoirs, supporting field development, and enhancing hydrocarbon recovery strategies. The course covers advanced measurement principles and interpretation methods for modern well logging tools. Key logging techniques discussed include: Nuclear Magnetic Resonance (NMR) logging, Formation Micro Imager (FMI/EMI), Cement Bond Log (CBL/VDL), Pulsed Neutron Logging (Sigma and C/O), and Production Logging Tools (PLT). These tools are vital for evaluating porosity types, permeability variations, saturation distributions, fluid mobility, and wellbore integrity. Further topics include the physical measurement environments in both open and cased holes, borehole effects, tool limitations, and environmental corrections. Emphasis is also placed on the integration of advanced logs with conventional data (such as density, neutron, and resistivity) and core analysis to create a robust formation evaluation model. The course also introduces students to digital platforms like Techlog or Interactive Petrophysics (IP), enabling hands-on experience with real field datasets. Through interpretation exercises and guided projects, students will build confidence in analyzing complex logs and developing practical reservoir insights. During group-based case studies, students learn to collaborate effectively, address data uncertainty, and apply sound reasoning to solve interpretation challenges. Working with real-world data sharpens their ability to make justified decisions in dynamic and heterogeneous reservoir conditions.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Teaching/Learning Strategies include: 4- Direct Instruction in classroom, 4 hrs. per week. 5- Classroom Discussions 6- Group Design Projects 4- Seminars Methods of assessment for students. 4- Compulsory exercises 5- Quarterly exams. 6- Discussions and assignments for project. *The overall assessment for this course is as follows: Annual pursuit of ٥٠ points from the total mark, which includes assignments, oral examinations and quarterly in addition to presentations. *٥٠ marks for the final exam



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
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بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



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	2.125
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 and 10	LO #1, #2 and #10, #11
	Class Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects	1	10% (10)	9	LO #5, #8 and #10
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction and Role of Advanced Logs in Reservoir Evaluation
Week 2,3	NMR Logging: Principles, Tools Physics and Interpretation (Porosity Types, Bound vs Free Fluids, Fluid Typing).
Week 4	FMI/EMI Imaging Tools: Fundamentals and Data Acquisition
Week 5	FMI Interpretation: Fractures, Borehole Breakouts, and Structural Analysis.
Week 6	CBL/VDL Logs: Acoustic Principles and Cement Evaluation
Week 7,8, 9	PLT: Introduction, Principles, Tools Physics, Spinner, Temperature, Pressure, and flow Profiles, Leak Detection, Production Analysis.
Week10,11,12	Pulsed Neutron Logs: Sigma & C/O Principles, applications: Saturation Monitoring in Cased Holes, environmental Corrections and Tool Limitations in Cased and Open Holes.
Week 13	Integration with Conventional Logs & Core Data
Week 14,15	Field case studies using integrated advanced log data; interpretation, discussion, and presentation.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Well Logging for Earth Scientists (2nd ed.) Ellis, D.V., & Singer, J.M. (2007) The Geological Interpretation of Well Logs (2nd ed). Rider, Malcolm & Kennedy, Martin (2011).	Yes
Recommended Texts	Asquith, G., Krygowski, D., & Henderson, S. (2004) (Basic Well Log Analysis (2nd ed.) Serra, O. (1984) Fundamentals of Well-Log Interpretation, Volume 1 & 2. Elsevier	Yes
Websites	None	



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
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بكالوريوس في هندسة النفط (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية
كل وحدة ائتمانية = ٢٥ ساعة



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 5

Module Information					
معلومات المادة الدراسية					
Module Title	Engineering Analysis II		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	PE 325				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		3	Semester of Delivery		2
Administering Department		Petroleum Eng.	College	Engineering College	
Module Leader	Sabah Falah		e-mail	sabahalhamdi@uomisan.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		17/06/2025	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 Objectives أهداف المادة الدراسية	This module provides students with a solid foundation in mathematical principles and problem-solving techniques necessary for understanding and analyzing complex engineering problems in petroleum engineering. It is intended to expose the students to understand the basic ideas of differential equations (DE) combined with its solutions using Bessel's function, Gamma function, and Laplace Transforms. This module is also aimed to understand how to solve the differential equations using numerical methods. By understanding the fundamentals of numerical methods, the results of numerical methods in solving the DE can be compared with the analytical solution which



	represents the exact solution. Partial differential equations with its properties and how the initial value problems can be analyzed and solved will be covered in this module. This module is a fundamental module that provides students with the mathematical skills and knowledge necessary for solving engineering problems in the petroleum industry. It covers a range of mathematical concepts and techniques applicable to various engineering disciplines, including petroleum engineering. As overall as, scientists and engineers must know how to model the world in terms of differential equations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of this module, students will be able to: 7- Solve the 2 nd DE with variable coefficients using different functions and methods such as Bessel's function, and Gamma function. 8- Understand the importance of Laplace Transforms in solving the DEs. 9- Understand the definition of Laplace Transforms, transform of Elementary functions such as Trigonometric, Exponential, and Polynomial functions, as well as properties of Laplace Transforms. Inverse Laplace Transforms will also be applied to reach the solution of differential equations. 10- Understand the basic functioning of numerical methods including Basic and Modified Euler methods and compare that with the analytical exact solution. 11- Understand the basic of partial differential equations and how it can be used to solve the initial-value problems.
Indicative Contents المحتويات الإرشادية	The Module of Engineering Analysis II is Solve the 2 nd DE with variable coefficients using different functions and methods such as Bessel's function, and Gamma function. Understand the importance of Laplace Transforms in solving the DEs. Understand the definition of Laplace Transforms, transform of Elementary functions such as Trigonometric, Exponential, and Polynomial functions, as well as properties of Laplace Transforms. Inverse Laplace Transforms will also be applied to reach the solution of differential equations. Understand the basic functioning of numerical methods including Basic and Modified Euler methods and compare that with the analytical exact solution. Understand the basic of partial differential equations and how it can be used to solve the initial-value problems.

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 discussion in class and quick quizzes. This will be achieved through classes, interactive tutorials and by considering a simple type of strategy involving some of examples related to petroleum industry that have been solved and understood using differential equations. * Lectures are conducted by face-to-face education in the classroom, two hours per week, and students' technical reports. * Conducting dialogues and discussions with the request Methods of assessment for students. * Quarterly exams. * Discussions and assignments. * The overall assessment for this course is as follows:
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جمهورية العراق - وزارة التعليم العالي والبحث العلمي
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	Annual pursuit of 30 points from the total mark, which includes quizzes, assignments in addition to presentation. *70 marks for the final exam
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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	2.125
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	Exams	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Presentation	1	10% (10)	9	LO #3, #4 and #6, #7
	Report	1	10% (10)	13	LO #3, #4 and #6, #7
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 and LO #7
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Ordinary Differential Equations and Partial Differential Equations.
Week 2	Introduction to the Laplace Transforms
Week 2, 3	Understanding the transformation of Elementary functions such as Trigonometric, Exponential, and Polynomial functions, as well as properties of Laplace Transforms.
Week 4,5	Learn students how to apply the Inverse Laplace Transforms characteristics by which the differential equation can be solved.
Week 6,7	Understand the definition of Laplace Transforms, transform of Elementary functions such as Trigonometric, Exponential, and Polynomial functions, as well as properties of Laplace Transforms. Inverse Laplace Transforms will also be applied to reach the solution of differential equations.
Week 8,9	Applications of numerical methods to solve the differential equations and perform a comparison between the numerical methods and exact solutions.
Week 9	Fourier Series
Week 10,11	Fourier Sine and cosine series.
Week 12	Solution of the Diffusion equation.
Week 13, 14	Solution of the wave equation.
Week 15	Preparation and Help Session for the Final Exam.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Curriculum and textbook	Yes
Recommended Texts	- Engineering Mathematics", by John Bird, 5th edition, Elsevier Ltd., 2007 - Advanced Engineering Mathematics", by Peter V. O'Neil, 7th Edition, Cengage Learning, 2012	Yes
Websites	None	



جمهورية العراق - وزارة التعليم العالي والبحث العلمي
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Group	Grade	التقدير	Marks %	Definition
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	F – Fail	راسب	(0-44)	Considerable amount of work required

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Module 6

Module Information					
معلومات المادة الدراسية					
Module Title	Pollution and industrial safety		Module Delivery		
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	PE 326				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		3	Semester of Delivery		2
Administering Department		Petroleum Engineering	College	Engineering college	
Module Leader	Ali Alhraishawi		e-mail	Alihussin2294@uomisan.edu.iq	
Module Leader's Acad. Title		Lect.	Module Leader's Qualification		Ph.D.
Module Tutor			e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		17/01/2025	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 Objectives أهداف المادة الدراسية	1. Understand the fundamental concepts of environmental science, industrial safety, and sustainable development, and explain their importance in engineering and industrial applications. 2. Identify and evaluate the major sources, causes, and impacts of air, water, and soil pollution on human health and the environment. 3. Describe and apply appropriate pollution prevention and control technologies for air emissions, industrial wastewater, and hazardous waste management. 4. Assess industrial hazards and implement occupational health and safety practices, including risk assessment, personal protective equipment (PPE),



	emergency response, and accident prevention strategies. 5. Apply environmental management and safety standards, including ISO 14001 and ISO 45001 principles, to promote sustainable industrial operations and regulatory compliance. 6. These objectives are suitable for an undergraduate engineering module and align with outcome-based education (OBE) and accreditation frameworks such as ABET.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	☐ Explain the fundamental principles of environmental science, industrial safety, and sustainable development. ☐ Identify the major sources, types, and impacts of air, water, and soil pollution on human health and the environment. ☐ Analyze environmental pollution problems and recommend appropriate pollution prevention and control measures. ☐ Apply wastewater treatment and air pollution control technologies used in industrial and environmental engineering. ☐ Assess workplace hazards using basic risk assessment methods and propose suitable control measures to improve occupational safety. ☐ Demonstrate the proper selection and use of personal protective equipment (PPE) and emergency response procedures in industrial environments. ☐ Interpret environmental and occupational health regulations, including the principles of ISO 14001 and ISO 45001 management systems. ☐ Develop practical and sustainable solutions to environmental and industrial safety challenges through case studies and engineering applications.
Indicative Contents المحتويات الإرشادية	This module introduces the fundamental concepts of environmental science and industrial safety, emphasizing their importance in sustainable engineering and industrial practices. It covers the components of the environment, environmental challenges, and the principles of sustainable development. Students will study the sources, characteristics, and impacts of air, water, and soil pollution, together with modern pollution prevention and control technologies. The module also addresses industrial wastewater treatment methods, hazardous waste management, and strategies for minimizing environmental contamination. The industrial safety component focuses on workplace hazards, accident prevention, risk assessment, and occupational health principles. Students will learn about chemical, physical, biological, electrical, and fire hazards commonly encountered in industrial facilities, as well as the appropriate use of personal protective equipment (PPE), emergency preparedness, and fire protection systems. The course also introduces environmental and occupational safety management systems, including the principles of ISO 14001 and ISO 45001, environmental legislation, and regulatory compliance. Through engineering case studies and practical examples, students will develop the ability to identify environmental and safety issues, evaluate potential risks, and recommend effective engineering solutions. The module highlights the integration of environmental protection, occupational health, and industrial safety to promote sustainable industrial development and responsible engineering practice while ensuring the protection of workers, the public, and the environment.



Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Teaching/Learning Strategies include: 1- Direct Instruction in classroom, 4 hrs per week. 2- Classroom Discussions 3- Group Design Projects 4- Seminars
	Methods of assessment for students. 1- Compulsory exercises 2- Quarterly exams. 3- Discussions and assignments for project. *The overall assessment for this course is as follows: Annual pursuit of 30 points from the total mark, which includes assignments, oral examinations and quarterly in addition to presentations. *70 marks for the final exam

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.11
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Homework	1	10% (10)	9	LO #3, #4 and #6, #7
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		



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كل وحدة ائتمانية = ٢٥ ساعة



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Environment and Industrial Safety
Week 2	Environmental Components and Sources of Pollution
Week 4	(Air Pollution: Sources, Pollutants, and Impacts)
Week 5	(Air Pollution Control Technologies)
Week 6	Water Pollution: Sources, Pollutants, and Impacts
Week 7	(Soil Pollution and Solid/Hazardous Waste Management)
Week 8	(Midterm Examination)
Week 9	(Industrial Safety and Risk Assessment)
Week 10	(Personal Protective Equipment and Safety Systems)
Week 11	(Hazardous Chemicals: Handling and Storage)
Week 12	(Fire Safety, Explosion Prevention, and Emergency Response)
Week 13	(Occupational Health and Industrial Hygiene)
Week 14	(ISO 14001 & ISO 45001)
Week 15	(Sustainability, Cleaner Production, and Circular Economy)

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Occupational Safety and Health for Technologists, Engineers, and Managers	No
Recommended Texts	Handbook of Environmental Engineering	No
Websites	None	



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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 7

Module Information				
معلومات المادة الدراسية				
Module Title	Geophysics		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	PE 324			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level	3	Semester of Delivery		
Administering Department		Petroleum Eng.	College	Engineering college
Module Leader	Zahraa R. Fakher		e-mail	geologist_2021@uomisan.edu.iq
Module Leader's Acad. Title		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		01/06/2025	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	Teaching the principle of geophysical exploration.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Learning the students, the main physical principles the used in petroleum exploration. And the equipment and techniques which developed for this purpose.



Indicative Contents المحتويات الإرشادية	Geophysical maps, Geo sections.
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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	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 9	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	4 and 11	LO #3, #4 and #6, #7
	Projects	1	10% (10)	13	LO #3, #4 and #6, #7
	Report	1	10% (10)	14	LO #3, #4 and #6, #7
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 and LO #7
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المناهج الأسبوعية النظرية

	Material Covered
Week 1	Define geophysics. What are the main physical properties of the rocks?
Week 2	The main physical laws used in geophysical exploration; Snell, Newton, and wave propagation.
Week 3	Gravity Method
Week 4	Application and Problems about gravity method.
Week 5	Analysis the gravity geophysical maps for petroleum traps.
Week 6	Magnetic Method.
Week 7	Application and examples of magnetic method.
Week 8	Examples of basement rock analysis by magnetic surveying.
Week 9	The main equipment and methods
Week 10	Refraction Methods
Week 11	Examples and problems about refraction interpretation
Week 12	Analysis the distribution of subsurface structures using refraction waves
Week 13	Reflection Method, the 2D, 3D and 4D seismic surveying
Week 14	Examples of reflection sections Interpretation
Week 15	Project Discussions
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Geophysics for Petroleum Engineers , Fred Aminzadeh , Shivaji N. Dasgupta	No
Recommended Texts	On significant application of geophysical methods, Mansour Al Garni, 2018	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	



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