Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Al-Kitab University/College of Engineering

Petroleum Department

Description of Academic Program

(English Version)

Academic Year 2023-2024

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must

determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: Al-Kitab University

Faculty/Institute: engineering of survey

Scientific Department: engineering of Survey department

Academic or Professional Program Name: Bachelor of Science in Survey Engineering

Final Certificate Name: Bachelor of Science in Survey Engineering

Academic System: Annual

Description Preparation Date: 11/2/2024

File Completion Date: 11/2/2024

Signature:

Head of Department Name:
Dr. Adil M. Raheem

Date: 3/4/2024

Signature:

Scientific Associate Name:
Dr. Salim K. Kasim

Date: 3/4/2024

جامعة الكتاب
هندسة المساحة

The file is checked by: Dr. Noor Nabeel

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: Dr. Ali Ismael

Signature:

Al Kitab University
College of Engineering

Approval of the Dean

1. Program Vision

Our vision for the Department of Petroleum Engineering is for it to be known as a future leader in the field of petroleum engineering, and for it to be among the ranks of engineering educational institutions recognized in the Arab world and internationally that are distinguished by teaching innovative educational programs and producing solid scientific research that serves diverse segments of society through graduates who possess high skills capable of communication. Dealing with society and its development prospects.

2. Program Mission

The mission of the Department of Petroleum Engineering, College of Engineering at Al-Kitab University, is to direct and adapt all its resources to achieve excellence in education and research, and to contribute to improving infrastructure throughout Iraq and providing engineering services in petroleum operations.
This message includes the basic elements in improving engineering performance, including education, scientific research, continuing education, community service, qualifying professional competencies in engineering sciences, and contributing effectively to scientific research and community service, through a stimulating environment to acquire, disseminate and produce knowledge in engineering, and optimal employment of cadres.

3. Program Objectives

The aim of this program is to provide high-quality education to students in this branch of engineering and adequately prepare them to meet the current challenges in their profession and be able to deal with them in the future. Upon graduation, students acquire sufficient skills in critical thinking, problem solving, and communication to achieve a successful career. Their background will provide them with the opportunity to easily pursue postgraduate programmes, enabling them to take on a future role in teaching and research, if they so choose. During their studies, they will develop a spirit of teamwork and understand the desire to follow professional ethics in order to effectively serve society.

4. Program Accreditation

none

5. Other external influences

none

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	4	4	2.35	

College Requirements	**6**	**71**	**41.76**	
Department Requirements	**28**	**95**	**55.88**	
Summer Training	**1**			
Other				

* This can include notes on whether the course is basic or optional.

7. Program Description

First Year		First Semester				Second Semester			
Cod	Subject Title	ECTS	Weekly Hours			ECTS	Weekly Hours		
			The.	Tut.	Lab.		The.	Tut.	Lab.
UOKB6PE101	Mathematics I	8.00	4	2	0	-	-	-	-
UOKB6PE102	Analytical Chemistry	8.00	4	0	2	-	-	-	-
UOKB6PE103	Computer Programming I	3.00	1	0	2	-	-	-	-
UPKB6PE104	Descriptive Geometry	7.00	4	0	0	-	-	-	-
UOKB6PE105	Arabic Language	2.00	2	0	0	-	-	-	-
UOKB6PE106	Human Rights and Democracy	2.00	2	0	0	-	-	-	-
UOKB6PE107	Mathematics II	-	-	-	-	8.00	4	2	0
UOKB6PE108	General Geology	-	-	-	-	6.00	3	0	2
UOKB6PE109	Physics	-	-	-	-	4.00	2	2	0
UPKB6PE110	Statics and Dynamics	-	-	-	-	5.00	3	2	0
UOKB6PE111	Engineering Drawing	-	-	-	-	5.00	2	0	2
UOKB6PE112	English Language	-	-	-	-	2.00	2	0	0
Total		**30**	**17**	**2**	**4**	**30**	**16**	**6**	**4**

Second Year		*First Semester*				*Second Semester*			
Cod	*Subject Title*	*Credit Hours*	*Weekly Hours*			*Credit Hours*	*Weekly Hours*		
			The.	*Tut.*	*Lab.*		*The.*	*Tut.*	*Lab.*
KTB00202	Democracy	1	1	1	0	1	1	1	0
MAT10209	Mathematics II	3	3	1	0	3	3	1	0
COP10210	Computer Programming II	2	1	0	2	2	1	0	2
ENL10211	English Language II	2	2	0	0	2	2	0	0
ELM10212	Fluid Mechanics	2	2	1	0	3	2	1	2
ENT11213	Eng. Thermodynamics	3	3	1	0	0	0	0	0
STM12214	Strength of Materials	0	0	0	0	3	2	1	2
PEN21202	Petroleum Properties	2	1	0	3	0	0	0	0
PEN20203	Fundamentals of Petroleum Engineering	2	2	1	0	2	2	1	0
PEN20204	Structural and Petroleum Geology	3	2	0	2	3	2	0	2
Total		**20**	**17**	**5**	**7**	**19**	**15**	**5**	**8**

Third Year		*First Semester*					*Second Semester*		
Cod	*Subject Title*	*Credit Hours*	*Weekly Hours*		*Credit Hours*		*Weekly Hours*		
			The.	*Tut.*	*Lab.*		*The.*	*Tut.*	*Lab.*
ENM10315	Engineering Mathematics	3	3	1	0	3	3	1	0

TEE10316	Technical English	2	2	0	0	2	2	0	0
ENS12317	Engineering Statistics	0	0	0	0	2	2	1	0
PEN20305	Petroleum Reservoir Eng. I	4	3	1	2	4	3	1	2
PEN20306	Petroleum Drilling Eng. I	4	3	1	2	4	3	1	2
PEN20307	Petroleum Production Eng. I	2	2	1	0	2	2	1	0
PEN20308	Well Logging	3	3	1	0	3	3	1	0
PEN21309	Geophysics	2	2	1	0	0	0	0	0
PEN20310	Petroleum Engineering Economics	2	2	0	0	2	2	0	0
Total		**22**	**20**	**6**	**4**	**22**	**20**	**6**	**4**

Fourth Year		*First Semester*				*Second Semester*			
Cod	*Subject Title*	*Credit Hours*	*Weekly Hours*		*Credit Hours*		*Weekly Hours*		
			The.	*Tut.*	*Lab.*		*The.*	*Tut.*	*Lab.*
PEN21411	Gas Technology	3	3	0	0	0	0	0	0
PEN22412	Optimization	0	0	0	0	3	3	0	0
PEN20413	Integrated Reservoir Management	1	1	1	0	2	1	1	1
PEN20414	Petroleum Reservoir Eng. II	3	2	2	0	3	2	2	0
PEN20415	Petroleum Drilling Eng. II	3	2	2	0	3	2	2	0
PEN20416	Petroleum Production Eng. II	3	2	2	0	3	2	2	0
PEN20417	Secondary Oil Recovery	3	3	0	0	3	3	0	0
PEN20418	Numerical Methods and Reservoir Simulation	3	2	0	2	3	2	0	2
PEN20419	Engineering Project	2	1	0	2	2	1	0	2
Total		**21**	**16**	**7**	**4**	**22**	**16**	**7**	**5**

8. Expected learning outcomes of the program

Knowledge	
It is the ability to remember, retrieve and repeat information without changing anything, such as knowing specific facts. Knowledge of specific events, dates, people, characteristics, technical and scientific terms	Mention, identify, identify, write, describe, identify, arrange, organize, record, enumerate, name...etc.
Skills	
It means the skills that form and grow in the student during the teaching and learning processes, and which show the nature of his dealings with his colleagues and teachers, such as personal skills and responsibility, communication and information technology skills, numerical skills, and the skill of cooperating with others in an atmosphere of friendliness and understanding, and this is done through Working in groups as a team in the laboratory, or by taking scientific trips in the surrounding environment to visit factories, science museums, or public libraries. Examples of these skills include communication skills and the skills of applying knowledge in new situations, or what are known as transferable skills.	A- General and transferable skills. B- Skills related to the subject. T- Skills. D- Mentality and mentality.
Learning Outcomes 3	Learning Outcomes Statement 3
Ethics	
Taking responsibility for learning and self-	Taking responsibility for learning and self-development

development in university studies.	in university studies.
Demonstrate self-confidence and leadership ability.	Demonstrate self-confidence and leadership ability.

9. Teaching and Learning Strategies

Since its establishment in 2016, the Department of Petroleum Engineering, College of Engineering, has been making strategic plans in the fields of education, scientific research, community service and development, as well as in the field of performance development. The department is no longer just a place where the student receives cognitive experiences, but university study has become the effective medium for developing the student's personality comprehensively and preparing him engineeringly for the life of society. Therefore, students are subjected to various activities that prepare them to be effective in society for its development and progress.

First: The Petroleum Engineering Department's education strategy:

1. Implementing relevant regulations and laws.
2. Activating the academic advising system.
3. Working to attract students
4. Working to achieve quality standards and quality assurance.
5. Activating the continuing education system.
6. Providing student support in all fields.
7. Increase student activities.
8. Shifting towards e-learning and smart education.
9. Updating educational programs in line with the needs of the labor market.
10. Description of programs and courses in accordance with academic standards.
11. Providing technological means to support education.
12. Preparing the infrastructure, laboratories and classrooms to match the standard standards to ensure the quality of education.
13. Training faculty members and their assistants on how to use modern methods of education.
14. Encouraging students to take responsibility for their studies and complete their academic education.

Second: The strategy of the Petroleum Engineering Department in the areas of scientific research

1- Strategic development of scientific research related to the college's strategy.
2- Apply the research strategy and work to solve any obstacles.
3- Organizing scientific seminars with the aim of scientific communication, deepening concepts, and raising the engineering level.
4- Activating joint research between corresponding departments and colleges.
5- Working to bring local, regional and international research projects.

6- Concluding engineering and scientific agreements with corresponding bodies and institutions at the local and global levels with the aim of exchanging experiences and conducting research related to various specializations.
7- Support distinguished research.
8- Working to market scientific research.
9- Benefiting from scientific research to support the educational process and serve society.
10- Preparing the infrastructure and providing the necessary equipment and tools for scientific research.
11- Benefiting from scholarships and scholarships in conducting advanced research.
12- Disseminating the ethics of scientific research.
13- Training faculty members and their assistants on modern scientific research methods.
14- Participation in conferences, seminars and workshops related to scientific research.
15- Stimulating publication in peer-reviewed scientific journals with solid indicators of impact.

10. Evaluation methods

1. Regular attendance in class according to the schedule.
2. Skills in the classroom.
3. Homework.
4. Tests.

11.Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Assistant lecturer	Fuel and energy	Chemical engineering			Staff	
Teacher	Mechanics and mechatronics	Thermal energy			Staff	
Assistant lecturer	Natural geography	GIS			Staff	
Assistant lecturer	mathematics	Numerical Analysis			Staff	
Assistant Teacher	Dams and water resources	Hydrology			Staff	
Teaching assistant	Oil Engineering	Oil Engineering			Staff	

Professor	geology	Sedimentary rocks and minerals			**Staff**	
Teacher	Applied mechanics	Vibrations			**Staff**	
Teaching assistant	Applied geology	Environmental geology			**Staff**	
Teacher	Mineral rocks	Petroleum geology			**Staff**	
Assistant lecturer	Geological sciences	general specialty			**Staff**	
Assistant lecturer	Electrical and computer engineering	Electrical power engineering			**Staff**	
Teacher	Geologist	Oil exploration (remote sensing and geographic information systems).			**Staff**	
Professor	Oil Engineering	Reservoir engineering			**Staff**	
Teacher	Oil Engineering	Reservoir engineering				**Lecturer**
Teacher	Oil Engineering	Reservoir engineering				**Lecturer**
Assistant Professor	Oil Engineering	Reservoir engineering				**Lecturer**

Professional Development

Mentoring new faculty members

1. Gain the necessary skills to build and develop the course.
2. It is provided with new teaching methods appropriate for the university stage.
3. Improves the level of performance in the field of teaching.
4. It helps to evaluate past and current teaching performance in an objective manner.
5. Provides key knowledge related to different learning theories.
6. Develops students' assessment skills.
7. Gain skills in ways to motivate students to learn.
8. Develops the skill of managing dialogue.
9. It provides the necessary skills to develop students' different thinking skills.
10. Improves the efficiency of methods related to guiding and counseling students.
11. Develops time management skills.

Professional development of faculty members

1 - The field of teaching: The development of a faculty member in his teaching performance depends on the extent of his readiness for the teaching process, as he must have professional, personal and social components, in addition to the availability of scientific components, as he is conversant and proficient in his specialty, and familiar with the best appropriate methods that achieve the goals. The desired goals that suit the nature and characteristics of the students.

2- The field of scientific research: The development of research expertise among faculty members is represented in the following: knowledge of methods for managing scientific research projects, techniques and methods for writing research articles, ways to improve the performance of the research team, methods for scientific supervision and joint supervision, research, design and application skills, and carrying out research operations. Research and statistical analysis through the computer, upgrading research skills and linking them to societal issues, and ways to obtain research grants and how to benefit from them.
3- The field of technology: Educational technology emphasizes the importance of the teacher or faculty member following the systems method in teaching. His task is no longer limited to explaining, delivering, and following traditional methods of teaching. Rather, his responsibility has become to draw a plan for the lesson strategy, so different and appropriate teaching methods and educational means are used. In order to achieve the desired goals.
4- The field of community service: It is all the activities and services that universities provide to non-employees, whether they are students, faculty members, or members of community groups and institutions. This includes all the training courses, consultations, scientific research, and educational programs they provide to serve the people of society. .

12. **Acceptance Criterion**

Central admission

13. **The most important sources of information about the program**

nothing

14. Program Development Plan

1 - Periodic evaluation and review of the program and the resulting recommendations or proposals specific to the program, based on the annual reports of the programs and course reports.
2 - Opinions of the program advisory committee, if any, regarding approving the development and modification of the program.
3 - Developments that have occurred in the field of the program in scientific and technical aspects, as well as recommendations for research and studies.
4 - Labor market variables, available jobs and their requirements.
5 - Recommending the university or any institutions outside it to develop existing programs.
6 - Results of opinion polls for beneficiaries of university graduates.
7 - National development requirements.
8 - Academic accreditation requirements at the national and international levels.
9 - The requirements of the Iraqi framework after five years or more have passed since the implementation of the study plan and the completion of the feedback.

Program Skills Outline														
				Required program Learning outcomes										
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First year / level one	UOKTB6PE101	Math one	optional	√	√	√		√	√			√	√	√	
	UOKTB6PE102	Analytical chemistry	Basic	√	√	√		√	√	√			√	√	
	UOKTB6PE103	Computer programs	optional	√	√	√		√	√	√		√	√	√	
	UPKTB6PE104	Descriptive geometry	Basic	√	√	√		√	√	√	√	√	√	√	
	UOKTB6PE105	Arabic	optional	√	√	√		√	√	√	√	√	√	√	
	UOKTB6PE106	Human rights and democracy	optional	√	√	√		√	√	√		√	√	√	
	UOKTB6PE101	Maths two	Basic	√	√	√	√	√	√	√		√	√	√	
	UOKTB6PE102	General geology	Basic	√	√	√	√	√	√	√	√	√	√	√	
	UOKTB6PE103	Physics	Basic	√	√	√	√	√	√	√		√	√	√	
	UPKTB6PE104	Dynamism and stillness	Basic	√	√	√		√	√	√		√	√	√	

- **Please tick the boxes corresponding to the individual program learning outcomes under**

	UOKTB6PE105	Engineering drawing	**optional**					√					√		
	UOKTB6PE106	English	Basic	√	√	√		√					√		

Program Skills Outline													
				Required program Learning outcomes											
Year/Level	**Course Code**	**Course Name**	**Basic or optional**	**Knowledge**				**Skills**				**Ethics**			
				A1	**A2**	**A3**	**A4**	**A1**	**A2**	**A3**	**A4**	**A1**	**A2**	**A3**	**A4**
Second Year / Second Leve	PEN20101	General geology	**Basic**	√	√	√		√				√	√	√	
	KTB00202	Democracy	**Basic**	√	√	√		√	√			√	√		
	MAT10209	Mathematics 2	**Basic**	√	√	√		√	√	√		√	√		
	COP10210	Programming2	**Basic**	√	√	√		√	√	√	√	√	√	√	
	ENL10211	English language 2	**Basic**	√	√	√		√	√	√	√	√	√	√	

	ELM10212	Fluids	**Basic**	√	√	√		√	√	√		√	√	√	
	ENT11213	Heat dynamics	**Basic**	√	√	√	√	√	√	√		√	√	√	
	STM12214	materials resistance	**Basic**	√	√	√	√	√	√	√	√	√	√	√	
	PEN21202	Oil properties	**Basic**	√	√	√	√	√	√	√		√	√	√	
	PEN20203	Fundamentals of petroleum engineering	**Basic**	√	√	√		√	√	√		√	√	√	
	PEN20204	Structural and petroleum geology	**Basic**	√	√	√		√	√				√	√	

Program Skills Outline

				Required program Learning outcomes											
Year/Level	**Course Code**	**Course Name**	**Basic or optional**	**Knowledge**				**Skills**				**Ethics**			
				A1	**A2**	**A3**	**A4**	**A1**	**A2**	**A3**	**A4**	**A1**	**A2**	**A3**	**A4**
	ENM10315	Engineering Mathematics	**Basic**	√	√	√		√				√	√	√	
	TEE10316	Technical English	**optional**	√	√	√		√	√			√	√		

Third Year / The third level	ENS12317	Engineering Statistics	**Basic**	√	√	√		√	√	√		√	√		
	PEN20305	Petroleum Reservoir Eng. I	**Basic**	√	√	√		√	√	√	√	√	√	√	
	PEN20306	Petroleum Drilling Eng. I	**Basic**	√	√	√		√	√	√	√	√	√	√	
	PEN20307	Petroleum Production Eng. I	**Basic**	√	√	√		√	√	√		√	√	√	
	PEN20308	Well Logging	**Basic**	√	√	√	√	√	√	√		√	√	√	
	PEN21309	Geophysics	**Basic**	√	√	√	√	√	√	√	√	√	√	√	
	ENM10315	Petroleum Engineering Economics	**Basic**	√	√	√	√	√	√	√		√	√	√	
	TEE10316	Engineering Mathematics	**Basic**	√	√	√		√	√	√		√	√	√	
	ENS12317	Technical English	**Basic**	√	√	√		√	√				√	√	

Program Skills Outline

				Required program Learning outcomes		
				Knowledge	**Skills**	**Ethics**

Year/Level Fourth year	Course Code	Course Name	Basic or optional	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4
	PEN21411	Gas Technology	optional	√	√	√		√	√	√		√	√	√	
	PEN22412	Optimization	optional	√	√	√		√	√			√	√	√	
	PEN20413	Integrated Reservoir Management	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	PEN20414	Petroleum Reservoir Eng. II	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	PEN20415	Petroleum Drilling Eng. II	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	PEN20416	Petroleum Production Eng. II	Basic	√	√	√	√	√	√	√		√	√		
	PEN20417	Secondary Oil Recovery	Basic	√	√	√	√	√	√	√		√	√		
	PEN20418	Numerical Methods and Reservoir Simulation	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	PEN20419	Engineering Project	Basic	√	√	√		√		√	√	√	√	√	

Course Description Form

1. Course Name:
Petroleum Engineering Economics
2. Course Code:
PEN20310
3. Semester / Year:
Third
4. Description Preparation Date:
20/2/2024
5. Available Attendance Forms:
In-person lectures
6. Number of Credit Hours (Total) / Number of Units (Total)
60 theoretical hours / units 4
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Jawad Radi Al-Asal Email: **Jawad.r. rustum@uoalkitab.edu.iq**

8. Course Objectives	
1. Understand the basic principles of petroleum economics engineering. 2. Learn different analytical methods. 3. Applying economic principles in oil and gas projects. 4. Develop critical and analytical thinking skills. 5. Understand the practical importance of economic study in oil projects. 6. Develop experimental skills.	1- This includes understanding the methods and techniques used in laws and accounts. 2- These methods include many methods and techniques, such as economic and financial analysis. 3- This is about applying knowledge acquired in the field of oil economics to solving financial problems. 4- The study of economics enhances students' ability to think critically and analytically in estimating data and results obtained from the results of financial accounts. 5- This involves understanding how economics is used in a variety of theoretical and practical applications such as industry, production, exploration and drilling. 6- The study of oil economics relies heavily on tests and acquiring the practical skills necessary to carry out analyzes and applications accurately and effectively.
9. Teaching and Learning Strategies	

Strategy	1. Participation in lectures: Encouraging students to participate in problems and solutions, which may contribute to a better understanding of theories and concepts and their application. 2. Group discussions and dialogues: Group discussions and dialogues can help enhance students' understanding of complex topics and exchange ideas and opinions between them. 3. Cooperative Learning: Encouraging students to work together on projects or exercises Cooperative learning can enhance their understanding and application of concepts. 4. Use of educational technology: Technical means such as interactive software and simulations can be used to explain concepts in a more detailed and interesting way. 5. Research Projects: Encouraging students to conduct research projects on interesting topics in the field of economics can enhance their understanding and research skills. 6. Continuous diagnostic assessment: Continuous and diagnostic assessment can help students identify strengths and weaknesses in their understanding and skills, which helps them continuously improve their performance.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	**2**	Learn basic concepts. Apply economic concepts and critical thinking with analysis. Effective communication skills, self-education and research with awareness of the financial system through interaction and collaboration	Oil and gas reserves	Active learning Cooperative learning Self-education Use of technology Continuous evaluation External learning	Monthly and semester exams with homework and exams at the end of the lecture
2	**2**		Organizations of oil exporting and importing countries		
3,4	**4**		International supply and demand On oil		
5	**2**		Petroleum classification		
6,7	**4**		Oil pricing		
8	**2**		The first midterm test		
9/10	**2**		Alternative Energy		
11	**2**		International energy strategy		
12	**2**		Time value of currency		
13	**2**		Types of interest rates		
14,15	**4**		Rate of Return		
16	**2**		Quarterly exam		
17	**2**		Exhaustion		
18,19	**4**		Depletion		
20,21	**2**		Consumption		
22	**2**		Tax collection		
23	**2**		Midterm exam of the second semester		
24	**2**		Economic inflation		
25	**2**		Sensitivity analysis of oil projects		

26,27	**4**		Risk analysis of production decline curves		
28	**2**		Evaluating the future production of oil and gas well sands		
29,30	**4**		Expenditures and net present ratio		

11. Course Evaluation
• First section 40% 1 - Midterm exam 10% 2 - Semester exam 15% 3 - The second midterm exam 10% 4 - Homework assignment of 5% distributed over the two semesters • Second section 60% Final exam for the subject

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	Economides, et al, Petroleum Production Systems, Prentice Hall, 1994
Recommended books and references (scientific journals, reports...)	Oil Economy / Dr. Nabil Jaafar Abdel Reda
Electronic References, Websites	

Course Description Form

1. Course Name:
Optimization
2. Course Code:
PEN22412
3. Semester / Year:
Year: 4th
4. Description Preparation Date:
4-3-2024
5. Available Attendance Forms:
In-person classes
6. Number of Credit Hours (Total) / Number of Units (Total)
Number of Credit Hours (Total): 45 Number of Units (Total): 3
7. Course administrator's name (mention all, if more than one name)
Name: Msc Osamah Amer Abduljaleel

Email: Osamah.amer@uoalkitab.edu.iq

8. Course Objectives

Course Objectives	• Understand the fundamentals of optimization and its applications in various fields. • Explain the concepts and techniques involved in linear programming. • Apply linear programming techniques to solve optimization problems • Utilize the graphical method to solve linear programming problems. • Implement the simplex method for solving linear programming problems efficiently. • Solve transportation problems using appropriate methods and algorithms. • Apply Lagrange multiplier method to optimize constrained functions. • Interpret and solve optimization problems in real-world applications across various domains. • Develop problem-solving skills through practical applications and case studies.

9. Teaching and Learning Strategies

Strategy	The course will employ a combination of lectures, interactive discussions, a problem-solving sessions to introduce students to the principles and techniques optimization. Hands-on exercises, case studies, and practical examples will utilized to reinforce theoretical concepts and enhance understanding.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1		Description of course outline			
2		Introduction			
3		Applications in optimization			
4		Linear programming			
5		Applications in linear programming			
6		Graphical method, applications in graphical method			
7		Exam 1			
8		Simplex method, applications in simplex method			

9		Transportation method, applications in transportation method			
10		Exam 2			
11		Nonlinear programming			
12		Applications in nonlinear programming			
13		Lagrange multiplier method			
14		Applications in lagrange multiplier method			
15		Revision			

11.Course Evaluation
Test 1: 20% Test 2: 15% Attendance and activities: 5% Final Exam: 60%

12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	• An Introduction to Optimization: Foundations and Fundamental Algorithms • Engineering Optimization Theory and Practice Fourth Edition • C. F. Palmer et al., Operational Research by Example © Colin F. Palmer and Alexander E. Innes 1980
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Integrated Reservoir Management

2. Course Code:	
PEN20413	
3. Semester / Year:	
Year: 4th	
4. Description Preparation Date:	
4-3-2024	
5. Available Attendance Forms:	
In-person classes	
6. Number of Credit Hours (Total) / Number of Units (Total)	
Number of Credit Hours (Total): 60 Number of Units (Total): 3	
7. Course administrator's name (mention all, if more than one name)	
Name: Msc Osamah Amer Abduljaleel Email: osamah.amer@uoalkitab.edu.iq	
8. Course Objectives	
Course Objectives	1. Understanding Reservoir Management: Grasp the principles and practices involved in effective reservoir management. 2. Interpreting Base and Isopach Maps: Develop skills in interpreting base maps, isopach maps, and understanding their significance in reservoir analysis. 3. Building Reservoir Models: Acquire the ability to construct reservoir models incorporating key parameters like isoporosity, bubble maps, and routine maps. 5. History Matching and Optimization: Understand and apply history matching techniques for reservoir models, and optimize surface facilities for enhanced production. 6. Fluids in Place Calculations: Develop skills in calculating initial fluids in place. 7. Economic Evaluation: Learn to perform economic evaluations of proposed reservoir strategies to assess their viability.
9. Teaching and Learning Strategies	
Strategy	Creating an engaging and interactive environment where students actively participate, fostering critical thinking, and providing divers

	resources to accommodate various learning styles, ultimately promoting a comprehensive understanding of the subject.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1		Definition of Reservoir Manageme Types of recovery Mechanisms. Objectives of Reservoir Manageme			
2		Synergy and team. Integration of Geosciences and engineering			
3		Integration Exploration and development Technology			
4		The Reservoir Management process			
5		Technology and Technological Toolbox Development plan and Economic			
6		Development Depletion strategy			
7		Data Acquisition and Analysis Geological and Numerical Studies			
8		Production and Reserves Forecast Facilities Requirement			
9		Economic Evaluation Management Approval			
10		Implementation Surveillance and Monitoring Evaluation			
11		First Exam			
12		Revision Plan and strategy Reasons for Failure of reservoir management			
13,14		Data acquisition and management			
15		Data Validation. Data Storing and Retrieval			
		Mid-year Exam			
16		Reservoir Model. Role of reservoir model.			

17 18 19 20,21 22,23 24 25 26 27,28 29,30		Reservoir Performance analysis an Forecast. Natural Production Mechanisms Reserves Definition Methods of Resources / Reserves Estimation. Reservoir Management Economic. Second Exam Case Study. Reservoir Management Plan Draft Tender Document Form To Conduct an Integrated Geologic &Reservoir Engineering Simulation Study. Technical Proposal of Reservoir Simulation study.			

11.Course Evaluation

Quiz: 5%
Mid- year exam: 15%
Second semester exam: 15%
Attendance and activities: 5%
Final Exam: 60%
Total: 100%

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Al-Assal, Jawad. (2019). Petroleum Reservoir Management handbook (Dr. Jawad R. Rustum Al-Assal).
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

1. Course Name: **Engineering Mathematics**

2. Course Code: ENM10315

3. Semester / Year:2023-2024

4. Description Preparation Date:17/2/2024

5. Available Attendance Forms: 17/2/2024

6. Number of Credit Hours (Total) / Number of Units (Total)

120/6

7. Course administrator's name (mention all, if more than one name)

Name: assit.Prof.Dr.Abdulwahab Mohammad Younis
Email: abdulwahab.younis@uoalkitab.edu.iq

8. Course Objectives

Course Objectives	Identifying many advanced mathematical topics and their applications in various engineering fields, especially in the field of petroleum engineering and its applications, thus providing the student with the skill of mastering and implementing the equations and theories he has learned in his field of specialization.

9. Teaching and Learning Strategies

Strategy	Urging students to read the latest modern editions of analytics books engineering and its applications, as well as encouraging students to solve more applied questions In the field of specialization, knowledge, and learning, modern programs that address

	This scientific aspect develops the student's ideas and expands his scientific background in his field of specialization

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Introduction	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class.
2	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Solution of first order diff. equations.	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework - Quizzes.
3	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Application of first order diff. equations'	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework
4	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Application of first order diff. equations.	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework - Quizzes.
5	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Solution of 2nd order homogeneous ordinary diff. equations.	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework
6	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Solution of 2nd order non homogeneous ordinary diff. equations.	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework - Quizzes.
7	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Solution of higher order ordinary diff. equations	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework
8	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Euler's or Cauchy's Equation	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework - Quizzes.
9	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Application of 2nd order ordinary diff. equations.	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework

10	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Application of 2nd order ordinary diff. equations.	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework - Quizzes.
11	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Application of 2nd order ordinary diff. equations.	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework
12	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Solution of simultaneous diff. equations.	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework - Quizzes.
13	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Solution of D.E. by Laplace transformation	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework
14	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Solution of D.E. by Laplace transformation	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework - Quizzes.
15	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Bessel's Functions	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class.
16	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Bessel's Functions	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework - Quizzes.
17	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Fourier Series	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework
18	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Fourier Series	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework - Quizzes. 5
19	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Derivation of wave equation	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework
20	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Partial diff. equations	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework - Quizzes.
21	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Partial diff. equations	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework
22	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Solution of wave equation	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework - Quizzes.
23	4	The student must acquire full knowledge and theoretical and practical	Applications of wave	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class.

		experience in the field of petroleum engineering	equation		- Homework
24	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	`Applications of wave equation	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework - Quizzes.
25	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Applications of wave equation	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework
26	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Numerical Methods and Taylor Series	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework - Quizzes.
27	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Numerical Methods and Taylor Series	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework
28	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Numerical Methods and Taylor Series	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class. - Homework - Quizzes.
29	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Numerical Methods and Taylor Series	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class.
30	4	The student must acquire full knowledge and theoretical and practical experience in the field of petroleum engineering	Numerical Methods and Taylor Series	Copy lecture, Data show, and board usage	- Regular Attendance - Skills in class.

11.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc

Annual pursuit = 40% distributed between Homework + daily and monthly exams + mid-year exam

Final exam = 60%

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	**Kreyszig, E." Advanced Engineering mathematics"**
Main references (sources)	Theory and Problems of Differential Equations,By Frank Ayres,JR,PhD
Recommended books and references (scientific journals, reports...)	Advanced Engineering Mathematics By Dass

Course Description Form

Course Name:
Structural Geology
Course Code:
PEN20204
Semester / Year:
2024-2025
Description Preparation Date:
20-02-2024
Available Attendance Forms:
Oral classroom attendance
Number of Credit Hours (Total) / Number of Units (Total)
60 Theoretical, 60 Practical Units 6
Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Ali Ismail Al-Juboury *Email: alialjubory@uoalkitab.edu.iq*

Course Objectives	
Course Objectives	*Learning the principles and importance of study the structural and petroleum geology* *Definitions of folds, faults, joints and fractures* *Unocnformity definition, reasons, types importance of study* *Sedimentary environments, continental, transition and marine* *Source, reservoir and cap rocks* *Migration* *Traps and importance* *Oilfields in Iraq*

Teaching and Learning Strategies	
Strategy	*Lectures* *Using modern technology* *Research Projects.* *Continuous Personal Assessment.*

Course Structure

Week	*Hours*	*Required Learning Outcomes*	*Unit or subject name*	*Learning method*	*Evaluation method*
1	*2*	*To learn the principles of structural and petroleum geology and relation to petroleum engineering*	*Principles of structural geology,* *mechanical principles,* *Deformation stages* *Folds and Importance of study* *Type of Folds* *Examination* *Faults, importance and types* *Joints importance and types* *Fractures importance of types* *Unconformity* *General Review* *Mid Term final exams* *Petroleum Geology and importance to study* *Continental and transitional sedimentary environments* *Marine environments* *Source Rocks* *Examination* *Reservoir rocks* *Migration Cap rocks* *Traps* *Seismic methods* *Oilfields in Iraq*	*Active Learning* *Cooperative Learning* *Self-learning* *Continuous Assessment* *External Learning*	*Monthly exams* *Homework* *Quiz* *Midterm exams*
2	*2*				
3,4	*4*				
5	*2*				
6,7	*4*				
8	*2*				
9,10	*4*				
11	*2*				
12,13	*4*				
14	*2*				
15	*2*				
16	*2*				
17	*2*				
18,19	*4*				
20,21	*4*				
22	*2*				
23	*2*				
24	*2*				
25	*2*				
26,27	*4*				
28	*2*				
29,30	*4*				

Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

- *Part 1%50*

- 1 1st monthly exam%10 *- 2 midterm exam %15* *- 3 2nd monthly exam %10* *- 4 Homework%5* *- 5 practical %10* *• Final%50* *• Practical final %15* *Final exam%35*	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	*Introduction to structural Geology*
Main references (sources)	
Recommended books and references (scientific journals, reports...)	*Principles of structural geology Arabic* *Principles in Petroleum geology*
Electronic References, Websites	*Various internet cites*

Course Description Form

1. Course Name:
Engineering Thermodynamics
2. Course Code:
ENT11213
3. Semester / Year:
Semester/ Second
4. Description Preparation Date:
01/03/2024
5. Available Attendance Forms:
Classroom attended lectures
6. Number of Credit Hours (Total) / Number of Units (Total)
45 hours theory, 15 hours practice/ 3 units
7. Course administrator's name (mention all, if more than one name)
Name: Assist. Proph. Dr. Jwad Radhi Al-Asal Email: Jawad.r. rustum@uoalkitab.edu.iq
8. Course Objectives

Course Objectives	• **Efficiency Improvement in Energy Systems:** One primary aim of studying engineering thermodynamics is to enhance the efficiency of energy conversion systems. By understanding the principles of thermodynamics, engineers can design and optimize power plants, engines, and other energy-related systems to maximize the conversion of energy from one form to another, ultimately leading to more sustainable and efficient energy utilization. • **Heat Transfer and Cooling Systems:** Thermodynamics plays a crucial role in the design and operation of heat transfer systems, including cooling systems for electronic devices, refrigeration systems, and HVAC (Heating, Ventilation, and Air Conditioning) systems. Studying engineering thermodynamics helps engineers

	design efficient heat exchangers and cooling mechanisms, ensuring proper temperature control in various applications. • **Environmental Impact and Sustainability:** The study of thermodynamics enables engineers to assess the environmental impact of energy processes and systems. By considering factors such as entropy and waste heat, engineers can develop strategies to minimize energy losses and enhance the sustainability of industrial processes, contributing to a more environmentally friendly approach to engineering. • **Optimizing Combustion Processes:** In fields such as automotive engineering and power generation, a deep understanding of thermodynamics is essential for optimizing combustion processes. Engineers can design combustion chambers and fuel systems to maximize energy extraction from fuels while minimizing emissions and waste heat, contributing to cleaner and more efficient combustion technologies. • **Materials and Process Design:** Thermodynamics influences the selection and design of materials in engineering applications. Understanding how materials behave under different temperature and pressure conditions is crucial for designing components that can withstand the demands of various processes. This knowledge is essential in fields like aerospace engineering, where materials must perform reliably under extreme thermodynamic conditions.

9. Teaching and Learning Strategies

Strategy	1. Participation in lectures: Encouraging students to participate in problems and solutions, which may contribute to a better understanding of theories and concepts and their application. 2. Group discussions and dialogues: Group discussions and dialogues can help enhance students' understanding of complex topics and exchange ideas and opinions between them. 3. Cooperative Learning: Encouraging students to work together on projects or exercises Cooperative learning can enhance their understanding and application of concepts. 4. Use of educational technology: Technical means such as interactive software and simulations can be used to explain concepts in a more detailed and interesting way. 5. Research Projects: Encouraging students to conduct research projects on interesting topics in the field of economics can enhance their understanding and research skills. 6. Continuous diagnostic assessment: Continuous and diagnostic assessment can help students identify strengths and weaknesses in their understanding and skills, which helps them continuously improve their performance.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1,2 3,4 5,6,7 8,9 10,11	4 4 4 4 4	Learn basic concepts. Apply economic concepts and critical thinking with analysis. Effective communication skills, self-education and research with awareness of the financial system through interaction and collaboration	**INTRODUCTION AND BASIC CONCEPTS** (Thermodynamics and Energy, Dimensions and Units, Systems And Control Volumes, Properties of a System, Density and Specific Gravity, Processes and Cycles, Temperature and The Zeroth Law of Thermodynamics, Pressure ….etc). **ENERGY** (Forms of Energy, Energy Transfer by Heat, Energy Transfer by Work, Mechanical Forms of Work, The First Law of Thermodynamics…Etc). **PROPERTIES OF PURE SUBSTANCES** (Pure Substance, Phases of Pure Substances, Saturation Temperature and Saturation Pressure, Property Diagrams for Phase-Change Process, Property Tables, Dryness Fraction, Superheated Vapor. IDEAL-GAS Equation of State).Thermal Strain and Stress. **First Law of Thermodynamics (CLOSED SYSTEM).** (Moving Boundary Work, Energy Analysis of Closed System, The Cycle, Internal Energy, Enthalpy and Specific Heats Of Ideal Gases, …etc). First Law of Thermodynamics (CONTROL VOLUMES) (Mass and Volume Flowrate,	Active learning Cooperative learning Self-education Use of technology Continuous evaluation External learning	Monthly and semester exams with homework and exams at the end of the lecture

12,13 14,15	4 4		Energy Analysis of a steady Flow System, , STEADY-FLOW Devices, Nozzles and Diffusers, Turbines and Compressors , Throttling Valves , Mixing Chambers , Heat Exchangers , …etc). THE SECOND LAW OF THERMODYNAMICS (The Heat-Engine (HE), Thermal Efficiency, Kelvin–Planck Statement, Refrigerators and HEAT PUMPS (HP), Coefficient of Performance COP, The CARNOT CYCLE…etc.). **ENTROPY** (Internally Reversible Isothermal Heat Transfer Processes, Entropy Change of Pure Substances, Isentropic Process, Entropy Change of Incompressible substances (Liquids and Solids), The ENTROPY CHANGE of Ideal Gases, Isentropic Efficiency of Turbines, Isentropic Efficiencies of Compressors and Pumps....etc).		

11.Course Evaluation

Distribution of grades :
- First section 40%

1 - The semester exam is 30%.
2 - 10% homework, attendance etc.
- Second section 60%

Final exam for the subject

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Thermodynamics An Engineering Approach 5th Edition by Yunus Cengel.
Main references (sources)	Engineering thermodynamics by R.K Rajput 4th edition. Fundamentals of Engineering Thermodynamics 5th Edition (Moran & Shapiro).
Recommended books and references (scientific journals, reports...)	Fundamental of Thermodynamics by Sonnt Borgnakke and van Wylen.
Electronic References, Websites	Accessing the Internet through the World Wide Web.

Course Description Form

1. Course Name:
Strength of Materials
2. Course Code:
STM12214
3. Semester / Year:
Semester/ Second
4. Description Preparation Date:
01/03/2024
5. Available Attendance Forms:
Classroom attended lectures
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours theory, 90 hours practice/ 3 units
7. Course administrator's name (mention all, if more than one name)
Name: Assist. Proph. Dr. Jwad Radhi Al-Asal Email: Jawad.r. rustum@uoalkitab.edu.iq
8. Course Objectives

Course Objectives	• **Engineering Design Optimization:** Understanding the strength of materials is crucial for engineers in designing structures, machines, and components that can withstand various loads and forces. This knowledge allows for the optimization of materials used in construction, manufacturing, and other applications to ensure safety, reliability, and efficiency. • **Structural Integrity and Safety:** Studying the strength of materials helps ensure the structural integrity and safety of buildings, bridges, and other infrastructure. Engineers need to analyze how different materials respond to stress, strain, and external forces to design structures that can withstand the demands of their intended use without compromising safety.

	• **Material Selection and Performance:** The study of materials' strength aids in the selection of appropriate materials for specific applications. Engineers need to consider factors such as tensile strength, compressive strength, shear strength, and fatigue resistance when choosing materials for components in machinery, vehicles, and various products to ensure optimal performance and durability. • **Failure Analysis and Prevention:** Analyzing the strength of materials is essential for identifying potential failure points and understanding the reasons behind structural failures. This knowledge allows engineers to implement preventive measures, design improvements, and maintenance strategies to enhance the overall reliability and longevity of structures and components. • **Innovation and Advancements:** Research and study in the strength of materials contribute to ongoing innovations in material science and engineering. Advancements in understanding how materials behave under different conditions lead to the development of new materials with improved strength, durability, and other desirable properties. This, in turn, opens up opportunities for the creation of more efficient and innovative technologies across various industries.

9. Teaching and Learning Strategies

Strategy	1. Participation in lectures: Encouraging students to participate in problems and solutions, which may contribute to a better understanding of theories and concepts and their application. 2. Group discussions and dialogues: Group discussions and dialogues can help enhance students' understanding of complex topics and exchange ideas and opinions between them. 3. Cooperative Learning: Encouraging students to work together on projects or exercises Cooperative learning can enhance their understanding and application of concepts. 4. Use of educational technology: Technical means such as interactive software and simulations can be used to explain concepts in a more detailed and interesting way. 5. Research Projects: Encouraging students to conduct research projects on interesting topics in the field of economics can enhance their understanding and research skills. 6. Continuous diagnostic assessment: Continuous and diagnostic assessment can help students identify strengths and weaknesses in their understanding and skills, which helps them continuously improve their performance.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2	5		**Stress and Strain** -Study and analysis of simple stress and		

3 4 5,6 7 8 9 10 11,12 13,14	5 5 5 5 5 5 5 5 5	Learn basic concepts. Apply economic concepts and critical thinking with analysis. Effective communication skills, self-education and research with awareness of the financial system through interaction and collaboration	simple strain. **Material Behavior** -Study the behavior of material under load (tensile test). **Hooke's Law** -To know where the Hooke's law apply. **Thermal Strain and Stress** -Study the strain and stress induced due -to temperature changes. Solve statically indeterminate problems due to temperature changes. **Pressure Vessels** -Stresses in pressure vessels. **Torsion of Circular Shaft** -Study the pure torsion for solid and -hollow circular shafts. Study the stress induced due to torsion. -Study the angular deformation induced due to torsion. **Beams: Shear force and Bending Moment** -Introduction to beams and loading types and the resulted shear and moment. **Beams: S.F. and B.M. Diagrams** -Draw the Shear force and Bending Moment in beams. **Stress in Beams** -Study the stress induced in beams due to lateral loads. -Economic section and how to calculate and reduce the induced stresses at beams. **Mohr's Circle**	Active learning Cooperative learning Self-education Use of technology Continuous evaluation External learning	Monthly and semester exams with homework and exams at the end of the lecture

15	5		-Graphical representation of stress at a point using Mohr's circle. -Systematic procedure of graphical representation of stresses at a point using Mohr's circle. **Bending with Torsion** -Study the stress due to combined bending and torsion loads. -Practical cases of the stresses induced due to combined bending and torsion loads.		

11. Course Evaluation

Distribution of grades :
- First section 50%

1 - The semester exam is 25% theoretical.
2 - Semester exam practical 15%
3 - 10% homework distributed over the two semesters
- Second section 50%

Final exam for the subject

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Strength of Materials – (Mechanics of Solids) , R.S. KHURMI - multicolour edition. (A Textbook for the students of B.E./B.Tech., A.M.I.E., U.P.S.C. (Engg. Services) and other Engineering Examinations) (SI UNITS)
Main references (sources)	Strength of Materials - Andrew Pytel , Ferdinand L. Singer - 3rd edition, 2000.
Recommended books and references (scientific journals, reports...)	A Textbook of Strength of Materials, by Rajput, S. Chand Publishing, 2018.
Electronic References, Websites	Accessing the Internet through the World Wide Web.

Course Description Form

1. Course Name:

Fluid Mechanics

2. Course Code:

FLM10212

3. Semester / Year:
annually/ Second
4. Description Preparation Date:
01/03/2024
5. Available Attendance Forms:
Classroom attended lectures
6. Number of Credit Hours (Total) / Number of Units (Total)
120 hours theory, 120 hours practice/ 5 units
7. Course administrator's name (mention all, if more than one name)
Name: Assist. Proph. Dr. Jwad Radhi Al-Asal Email: Jawad.r. rustum@uoalkitab.edu.iq
8. Course Objectives

Course Objectives	• **Understanding Fluid Behavior:** Fluid mechanics aims to provide a comprehensive understanding of the behavior of fluids, including liquids and gases. This encompasses the study of fluid properties, such as density, viscosity, and pressure, and how these properties influence fluid motion and interaction. This knowledge is fundamental for designing systems that involve fluid flow, such as pipelines, pumps, and ventilation systems. • **Analysis of Fluid Flow:** Fluid mechanics helps engineers and scientists analyze and predict the movement of fluids in different scenarios. Whether it's the flow of water through pipes, the aerodynamics of an aircraft, or the circulation of blood in the human body, understanding fluid flow patterns is crucial for optimizing designs, improving efficiency, and ensuring the safety and functionality of various systems. • **Design and Optimization of Engineering Systems:** The application of fluid mechanics principles is essential in the design and optimization of a wide range of engineering systems. Engineers use fluid dynamics to design efficient and effective systems for transporting fluids, such as hydraulic systems, cooling systems in engines, and aerodynamic shapes for vehicles. This knowledge is vital for creating systems that perform optimally while minimizing energy consumption and waste. • **Environmental Applications:** Fluid mechanics plays a crucial role in understanding and mitigating environmental issues. It is used to model and analyze the dispersion of pollutants in air and water, study the dynamics of ocean currents, and design systems for wastewater treatment. By applying fluid mechanics principles, engineers can develop strategies to address environmental challenges and contribute to sustainable practices. • **Advancements in Technology: The study of fluid mechanics is at the forefront of technological advancements. It underpins**

	innovations in fields such as aerospace engineering, automotive design, and biomedical engineering. Advances in fluid mechanics contribute to the development of faster and more efficient transportation, improved medical devices, and enhanced energy systems, pushing the boundaries of what is technologically possible. • **In summary, fluid mechanics serves as a foundational discipline with broad applications, ranging from designing everyday systems to addressing complex challenges in environmental science and technology.**

9. Teaching and Learning Strategies

Strategy	1. Participation in lectures: Encouraging students to participate in problems and solutions, which may contribute to a better understanding of theories and concepts and their application. 2. Group discussions and dialogues: Group discussions and dialogues can help enhance students' understanding of complex topics and exchange ideas and opinions between them. 3. Cooperative Learning: Encouraging students to work together on projects or exercises Cooperative learning can enhance their understanding and application of concepts. 4. Use of educational technology: Technical means such as interactive software and simulations can be used to explain concepts in a more detailed and interesting way. 5. Research Projects: Encouraging students to conduct research projects on interesting topics in the field of economics can enhance their understanding and research skills. 6. Continuous diagnostic assessment: Continuous and diagnostic assessment can help students identify strengths and weaknesses in their understanding and skills, which helps them continuously improve their performance.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1,2 3-5 6 7-9 10-12 13-16 17,18 19,20 21,22 23,24 25,26 27,28 29,30	8 8 8 8 8 8 8 8 8 8 8 8 8	Learn basic concepts. Apply economic concepts and critical thinking with analysis. Effective communication skills, self-education and research with awareness of the financial system through interaction and collaboration	**Fluid Properties.** **Fluid Statics.** **Fluid Kinematics.** Fluid dynamics. The energy equation. Flow of viscous fluids. **Flow Measurements; Pitot tube; Venturi meter, Orifice meter; Rota meter; etc.** **Series Parallel Fluid Flow.** **Impulse Momentum Equation.** **External Flow.** **Friction Losses in Pipes and Fittings.** **Fluid Machinery.** **Two-phase Flow.**	Active learning Cooperative learning Self-education Use of technology Continuous evaluation External learning	Monthly and semester exams with homework and exams at the end of the lecture

11.Course Evaluation

Distribution of grades :

- First section 50%
  - 1 - Exam I. 15%.
  - 2 - Exam II. 15%.
  - 3 - Practical Exam 10%.
  - 4 - homework, attendance etc 10%.
- Second section 50%

Final Exam (35% theory, 15% practical)

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Fluid Mechanics by Frank M. White, McGraw Hill, 2011.

Main references (sources)	A Textbook Of Fluid Mechanics and Hydraulic Machines, by Er. R.K. Rajput, 2008.
Recommended books and references (scientific journals, reports...)	Hydraulics, Fluid Mechanics and Hydraulic Machines by R.S. Khurmi, S. Chand and company Ltd., 1970.
Electronic References, Websites	Accessing the Internet through the World Wide Web.

Course Description Form

1. Course Name:	
Petroleum Drilling Engineering I	
2. Course Code:	
PEN20306	
3. Semester / Year:	
Year Three, 2 semesters	
4. Description Preparation Date:	
10/09/2023	
5. Available Attendance Forms:	
On campus	
6. Number of Credit Hours (Total) / Number of Units (Total)	
6/8	
7. Course administrator's name (mention all, if more than one name)	
Name: Pshtiwan Jaf Email: pshtiwan.jaff@uoalkitab.edu.iq	
8. Course Objectives	
Course Objectives	• A brief on historical developments happened to oil well drilling from 347CE and then all over the world up to date. • Learning the most important on the life of an ideal oil well up to abandonment. • Learning the main categories in classification of oil wells . • Learning how to collect of information required to develop a mud programmed. • Learning the types, functions of drilling fluids and solid removal equipment. • Learning the types the flow, rheological models, hydraulic equation for oil wells. • Learning types of drilling rigs, power calculation, fast line, deadline, hook, static and dynamic derrick loads calculation, cut-off length for slip and cut practice calculation…. etc.
9. Teaching and Learning Strategies	

Strategy	• Compulsory attending all the classes • Taking notes • Participating in solving the mathematical exercises. • Discussions

10. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
30	180		8	In Class	• HomeWorks • Quizzes • Assignments • Exams

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	• Annis, M.R. and Smith, M.V. (1996) Drilling Fluids Technology. USA: EXXON Company. • Baker Hughes INTEQ (1995) Drilling Engineering Workbook. Houston USA: Thorne. • Bommer, P. (2008) A Primer of Oil Well Drilling. 7th edn. Austin: University of Texas at Austin • Bourgoyne, A., Millheim, K., Chenevert, M. and Young F. (1991) Applied Drilling Engineering. Richadson: SPE. • Darley, H.C. and Gray, G.R. (1988) Composition and Properties of Drilling mud and Completion Fluids. 5th edn. Houston: Gulf Publishing Company. • Gatlin, G. (1996) Petroleum Engineering: Drilling and Well Completion. Texas: Prentice – Hall, INC. • International Association of Drilling Contractors (2000) Drilling Manual. Houston: IADC. • Lapeyrouse, N. J. (2002) Formulas and calculations for drilling production, and workover. 2nd edn. Amsterdam Boston: Gulf Professional Pub. • Mitchell, B. (1995) Advanced Oil well Drilling Engineering and Computer Programs. 10th edn. USA Library of Congress: Lakewood, USA.
Main references (sources)	Rabia, H. (2001) Well Engineering and Construction. Halesowen: ENTEC

Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Petroleum Drilling Engineering II
2. Course Code:
PEN20415
3. Semester / Year:
Year Four, 2 semesters
4. Description Preparation Date:
10/09/2023
5. Available Attendance Forms:
On campus
6. Number of Credit Hours (Total) / Number of Units (Total)
4/6
7. Course administrator's name (mention all, if more than one name)
Name: Pshtiwan Jaf Email: pshtiwan.jaff@uoalkitab.edu.iq

8. Course Objectives	
Course Objectives	The significant goal of teaching drilling engineering course is to provide the students with an all-inclusive knowledge of the drilling engineering, and design different parts such as drillstring, drill bit, casing and cementing for oil and gas wells. By the end of the course, the student is expected to be able to: • The objective is to learn principles of oil well drilling operation . • Familiarize students to work as driller engineers in the developed oil fields in Iraq . • Understand the aspects of drilling process and its analysis.

9. Teaching and Learning Strategies	
Strategy	• Compulsory attending all the classes • Taking notes • Participating in solving the mathematical exercises. • Discussions

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
30	180		8	In Class	• HomeWorks • Quizzes • Assignments

					• Exams

11. Course Evaluation
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	• Annis, M.R. and Smith, M.V. (1996) Drilling Fluids Technology. USA: EXXON Company. • Baker Hughes INTEQ (1995) Drilling Engineering Workbook. Houston USA: Thorne. • Bommer, P. (2008) A Primer of Oil Well Drilling. 7th edn. Austin: University of Texas at Austin • Bourgoyne, A., Millheim, K., Chenevert, M. and Young F. (1991) Applied Drilling Engineering. Richadson: SPE. • Darley, H.C. and Gray, G.R. (1988) Composition and Properties of Drilling mud and Completion Fluids. 5th edn. Houston: Gulf Publishing Company. • Gatlin, G. (1996) Petroleum Engineering: Drilling and Well Completion. Texas: Prentice – Hall, INC. • International Association of Drilling Contractors (2000) Drilling Manual. Houston: IADC. • Lapeyrouse, N. J. (2002) Formulas and calculations for drilling production, and workover. 2nd edn. Amsterdam Boston: Gulf Professional Pub. • Mitchell, B. (1995) Advanced Oil well Drilling Engineering and Computer Programs. 10th edn. USA Library of Congress: Lakewood, USA.
Main references (sources)	Rabia, H. (2001) Well Engineering and Construction. Halesowen: ENTEC
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Technical English
2. Course Code:

TEE10316
3. Semester /
Year: year
4. Description Preparation Date:
10-3-2024
5. Available Attendance Forms:
attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
4 unit
7. Course administrator's name (mention all, if more than one name)
Name:D Dalia kamran Email:dalia.kamran9@gmail,com
8. Course Objectives

Course Objectives	Developer ability to read, write and speak as it used in petrlu0m industry How to write graduation project.

9. Teaching and Learning Strategies

Strategy	

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 2 3 4 5 6 7 8 9	2 2 2 2 2 2 2 2 2		Trap and geology directional well Geology and trap Drive and stimulation Fishing job refining Reservoir fluid Natural flow Blow out Rig	Data show and power point	Attendance And daily quiz

11.Course Evaluation

Distribution of a score out of 100 according to the student's choice for daily preparation, daily, remedial, monthly, written exams, reports, etc. 15 First Semester
15 half year
15 Chapter Two
5 works of the year

12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Petroleum programing
Main references (sources)	Pl sandler
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

Course Name:
Geophysics
Course Code:
PEN21309
Semester / Year:
2023-2024
Description Preparation Date:
2024/02/20
Available Attendance Forms:
Classroom lectures
Number of Credit Hours (Total) / Number of Units (Total)
45theory hours, 2 units
Course administrator's name (mention all, if more than one name)
Name: Zaid Najm aldeen Azzat Email: zaid.najm@uoalkitab.edu.iq

Course Objectives	
Course Objectives	Geophysical studies employ various techniques to explore and analyze the Earth, including: -Gravity Prospecting: Relies on measuring variations in the gravitational field to detect changes in subsurface density, utilizing instruments called "gravimeters". -Seismic Prospecting: Involves sending seismic waves into the Earth's subsurface and recording their responses, providing insights into subsurface rock structures and topography. -Magnetic Prospecting: Measures variations in the Earth's magnetic field to detect changes in mineral distribution and terrain features. By utilizing these techniques, the geological and topographical characteristics of studied areas can be understood, facilitating exploration and extraction of natural resources such as minerals, petroleum, and gas.

Teaching and Learning Strategies	
Strategy	Gravity prospecting: principles, instruments, field measurements & reductions; interpretations; seismic prospecting: wave propagation, instruments, refraction and reflection methods, interpretation; magnetic prospecting: principles, instruments, measurements & interpretation; airborne magnetometer.

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1ad2	3		Gravity method	Active learning	

3	3	Learn the basic concepts. Apply economic concepts and critical thinking with analysis. Effective communication skills, self-learning, and research with awareness of the financial system through interaction and collaboration.	Newton's low of universal gravitation	Cooperative learning Self-learning Use of technology Continuous assessment	Monthly and seasonal exams with homework assignments and exams at the end of the lecture.
4	3		Gravitational potential and attraction		
5	3		Gravity measurements		
6	4		Gravity data correction		
7	3		Gravity anomaly interpretation		
8	3		Seismic method		
9	3		Factors controlling seismic velocities		
10	3		Seismic refraction method		
11	3		Seismic reflection method		
12	3		Magnetic method		
13	3		Use of Magnetic method		
14	4		Source of Magnetic method		
15	3		Interpretation of Magnetic Data		

Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	Kearey, P., Brooks, M., & Hill, I. (2002). An introduction to geophysical exploration (Vol. 4). John Wiley & Sons.
Recommended books and references (scientific journals, reports...)	Geophysics / Prof. Mahna Matouq Ahmad
Electronic References, Websites	Different Web site

Course Description Form

1. Course Name:
Well Logging
2. Course Code:
PEN20308
3. Semester / Year:
2023-2024
4. Description Preparation Date:
105hours the number of units 6
5. Available Attendance Forms:
Face-to-face lectures in the classroom.

6. Number of Credit Hours (Total) / Number of Units (Total)

4-6

7. Course administrator's name (mention all, if more than one name)

Name: zaid najm aldeen azzat Email:zaid.najm@uoalkitab.edu.iq

8. Course Objectives

Course Objectives	Studying these elements aims to understand the basic properties of rocks and their related petrophysics, and to determine the physical properties of rock formations such as resistance, sonic velocity, density, neutron composition, and gamma radiation. It also aims to use various tools such as available geological logs to identify and analyze the distribution of hydrocarbons and predict potential geological formations for hydrocarbons

9. Teaching and Learning Strategies

Strategy	Basic rock properties, petrophysics; SP log; conventional resistivit log, induction log; lateral log, macro resistivity log, sonic log, densi log, neutron log, gamma ray log, TDT log, CBL log and quick metho in (HC) detection.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	*4*	***Learn the basic concepts. Apply economic concepts and critical thinking with analysis. Effective communication skills, self-learning, and research with awareness of the financial system through interaction and collaboration.***	***Basic rock properties petrophysics***	***Active learning Cooperative learning Self-learning Use of technology Continuous assessment***	***Monthly and seasonal exams with homework assignments and exams at the end of the lecture.***
2	*4*		*Basic rock properties petrophysics*		
3	*4*		*Basic rock properties petrophysics*		
4	*4*		*Well logging instrument and techniques*		
5	*4*		*SP log*		
6	*4*		*SP log*		
7	*4*		*SP log*		
8	*4*		*Gamma ray log*		
9	*4*		*Gamma ray log*		
10	*4*		*Resistivity Log*		
11	*4*		*Resistivity Log*		
12	*4*		*Resistivity Log*		
13	*4*		*Resistivity Log*		
14	*4*		*Resistivity Log*		
15	*4*		*Resistivity Log*		
16	*3*		*Conventional Resistivity Log*		
17	*3*		*Induction log*		
18	*3*		*Induction log*		
19	*3*		*Macro resistivity log*		
20	*3*		*Macro resistivity log*		

21	3		Lateral log		
22	3		Lateral log		
23	3		Sonic log		
24	3		Sonic log		
25	3		Density log		
26	3		Density log		
27	3		TDT log		
28	3		TDT log		
29	3		TDT log		
30	3				

Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	*well analysis Antoine Mahrane Avdisan*
Recommended books and references (scientific journals, reports...)	*.1Openhole Log Analysis and Formation Evaluation, Richard M. Bateman.* *.2Well Logging for Earth Scientists 2nd Edition, Darwin V. Ellis.* *.3Advance wireline &MWD procedure manual, Baker Huges.* *.4Basic Petroleum Geology and Log Analysis , Halliburton, 2001.* *.5Fundamentals of Formation Evaluation, Donald P. Helander.* *.6Basic well logging and formation evaluation, Dr. Jurgen Schon.* *.7Basic Well Logging, Mandeep Kumar. ,* *.8Basic Well Log Analysis, Asquith, G.*
Electronic References, Websites	*Different Web site*

Course Description Form

13.Course Name:
Fundamentals of petroleum engineering
14.Course Code:
PEN20203
15.Semester / Year:
Year
16.Description Preparation Date:
1/3/2024
17.Available Attendance Forms:
Attendance
18.Number of Credit Hours (Total) / Number of Units (Total)
6/4
19. Course administrator's name (mention all, if more than one name)
Name: heba ismaeel abdulmohsen Email: heba.i.addulmohsen@uoalkitab.edu.iq
20.Course Objectives

Course Objectives	• **Reservoir engineering** • **drilling engineering** • **Production engineering**
21.Teaching and Learning Strategies	
Strategy	Brainstorming

	series of notes modern learning

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-3 *3-5* *6-7* *8-10* *11-12* *13-14* *15*	9 9 6 9 6 6 3		RESERVOIR ROCK PROPERTIES AND FLUID DISTRIBUTION; VOLUMETRIC CALCULATIONS OF OIL IN PLACE; NATURAL FORCES IN OIL AND GAS RESERVOIRS; OIL EXPLORATION; ROTARY DRILLING; RIG COMPONENTS; CASING, CEMENTING AND WELL COMPLETION; WELL LOGGING; SURFACE EQUIPMENT; IRAQI OIL FIELDS.	BRAINSTORMING, SERIES OF NOTES, MODERN LEARNING	ATTENDANCE, PARTICIPATION, BEHAVIOR

23.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

24.Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Fundamentals of petroleum engineering
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	Fundamentals of petroleum engineering

Course Description Form

25.Course Name:

Petroleum properties

26.Course Code:

PEN21202

27.Semester / Year:

Semester

28.Description Preparation Date:

1/3/2024

29.Available Attendance Forms:

attendance

30. Number of Credit Hours (Total) / Number of Units (Total)

3/2

31. Course administrator's name (mention all, if more than one name)

Name: Heba Ismaeel abdulmohsen
Email: heba.i.addulmohsen@uoalkitab.edu.iq

32. Course Objectives

Course Objectives	• Crude oils chemical composition • Properties of crude oil

33. Teaching and Learning Strategies

Strategy	Brainstorming series of notes modern learning

34. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
2-1 4-3 5 7-6 10-9 13-11 15-14 16	6 6 3 6 6 6 6 3	crude oils chemical composition, classification, properties content; evaluation; fractional distillation and tbp curve; analysis of fraction; dehydration of crude oil; natural gas properties; oilfield water properties.	crude oils chemical composition, classification, properties content; evaluation; fractional distillation and tbp curve; analysis of fraction; dehydration of crude oil; natural gas properties; oilfield water properties.	brainstorming, series of notes, modern learning	attendance, participation, behavior

35. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

36. Learning and Teaching Resources

Required textbooks (curricular books, if any)	PETROLEUM PROPERTIES

Main references (sources)	PETROLEUM PROPERTIES
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

Course Name:
Computer Programming II
Course Code:
COP10210
Semester / Year:
Year/second
Description Preparation Date:
19/3/2024
Available Attendance Forms:
Class attendance
Number of Credit Hours (Total) / Number of Units (Total)
60 hours / 4 units
Course administrator's name (mention all, if more than one name)
Name: Jawad radhi Alasal Email: Jawad.r.rustum@uoalkitab.edu.iq
Course Objectives

Course Objectives	Expand students' programming knowledge by exploring advanced programming concepts and techniques. • Familiarize students with the MATLAB programming language and its applications in data analysis and algorithm development • Develop skills in problem-solving, algorithmic thinking, and code optimization.
Teaching and Learning Strategies	
Strategy	Students will learn advanced programming techniques, numerical computing, data analysis, and visualization using MATLAB. Topics covered include matrices and array operations, control flow, function writing,

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 2 3,4	2 2 2	Learn about the concept of the program and its working environment MATLAB SYNTAX AND BASIC PROGRAMMING CONCEPTS REVIEW M Matrices and array operations	• Introduction to matlab and its environment • Learn about the main tools and how to apply them	Theoretical and practical application	Daily and monthly theoretical testing practically

5	2	**FUNCTION WRITING AND MODULAR PROGRAMMING**			
6,7	2	**FILE INPUT/OUTPUT OPERATIONS**			
9,10	2	**PLOTTING AND VISUALIZATION**			
11	2	**NUMERICAL COMPUTING AND SOLVING MATHEMATICAL PROBLEMS**			
12	2	**Data analysis and manipulation using MATLAB**			
13	2	**INTRODUCTION TO MATLAB'S TOOLBOXES AND APPLICATIONS**			
14	2	**BUILT-IN FUNCTIONS**			
15,16	2	**Linear algebra : linear combinations**			
17	2	**LINEAR ALGEBRA: EIGENVALUES**			

Course Evaluation
Grade distribution: 10 mark(5 marks for each semester quiz) 15 mark(first term exam) 15 mark(second term exam) 60 mark(10 class activities+35 theory final+15 practical final)

Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	1- MATLAB Programming for Engineers 5th Edition: Stephen J. Chapman

	2- Essential MATLAB for Engineers and Scientists: Seventh & Fifth Edition: Brian D. Hahn Daniel T. Valentine
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

37.Course Name:
Petroleum Production Engineering II
38.Course Code:
PEN20416
39.Semester / Year:
Year
Description Preparation Date:
20/3/2024
Available Attendance Forms:
Presence
Number of Credit Hours (Total) / Number of Units (Total)
96/3
40. Course administrator's name (mention all, if more than one name)
Name: A. M . Dr. Jawad Radhi Al-Asal Email: Jawad.r. rustum@uoalkitab.edu.iq
41.Course Objectives
The course aims to provide the student with a comprehensive knowledge of petroleum production engineering, including the subject of flow performance, multi-phase flow, tests for oil and gas wells, acidification and hydraulic fracturing operations, and artificial lifting operations. The course also aims to provide the student with information about production costs. The course also aims to Providing the student with the cognitive skills related to petroleum production engineering, developing the student's scientific thought, and giving him a complete picture of all production processes and the equipment and operational personnel, they require. The course also aims to link the theoretical aspect to the practical aspect and provide the student with cognitive skills in the field of production engineering and the basic definitions of this field.
42.Teaching and Learning Strategies

Strategy	1- Participation in lectures: Encouraging students to participate in problems and solutions, which may contribute to a better understanding of theories and concepts and their application.

	2- Group discussions and dialogues: Group discussions and dialogues can help enhance students' understanding of complex topics and exchange ideas and opinions between them. 3- Cooperative Learning: Encouraging students to work together on projects or exercises Cooperative learning can enhance their understanding and application of concepts.

43. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	*Cognitive objective* *1. That the student becomes familiar with the concept of flow performance and the methods for calculating it.* *2. That the student becomes familiar with the concept of oil well inspection, its types, and the data that can be obtained from each inspection.* *3. For the student to become familiar with multi-phase flow through pipes and methods for calculating pressure loss for multi-phase flow.* *4. For the student to become familiar with the acidification and hydraulic fracturing processes and the conditions for using each of the two methods.* *5. The student will be familiar with the*	**Ch 1: Well Testing Introduction**	*General and qualifying transferable skills (other skills related to employability and personal development(* *1-Verbal communication.* *2- The ability to express ideas clearly and confidently in speech.* *3- Teamwork Work confidently within a group.* *4- Planning and organizing (the ability to plan activities and implement them effectively).*	**Daily and monthly exams**
2	3		Derivation of Diffusivity Equation 1		
3	3		Derivation of Diffusivity Equation 2		
4	3		Solution of diffusivity Equation		
5	3		1) *Transient Radial flow (Infinite Acting Res.)*		
6	3		2) *Pseudo Steady State flow (No-Flow Outer Boundary)*		
7	3		3) *Steady State Flow (Constant-Pressure at Outer Boundary)*		
8	3		Super Position Solution 1		
9	3		Super Position Solution 2		
10	3		Well Testing Types: Build Up Test1		
11	3		Well Testing Types: Draw Down Test		
12	3		Average Drainage Area Pressure (Mattthews-Brons-Hazebroke Method), (MBH) P*		
13	3		**Ch 2: Inflow Performance Relationship Introduction**		
14	3		Types of Res. , and Radial flow in Res.		
15	3		Oil well Performance,& Productivity Index		
16	3		IPR Importance.		
			Half-year Break		
17	3		Methods to Construct IPR :1 Vogel's Method& Fitcovich		

18	3	*concept of artificial lift and the methods for doing so.*	Methods to Construct IPR :Standing's Method		
19	3		Methods to Construct Future IPR :Standing's Method		
20	3		Methods to Construct Future IPR :AL-Saadon Method		
21	3		**Ch 3: Multi-Phase Flow In Tubing & Flow Lines Intruduction.**		
22	3		Poettmann & carpenter method for vertical flow		
23	3		Gilbert's working chart for vertical flow		
24	3		Chock performance		
25	3		Gilbert's working chart for Horizontal flow		
26	3		**Ch 4: Acidizing Introduction**		
27	3		Type of acids,		
28	3		Acids additives		
29	3		Factor effluence on acid		
30	3		Ch 5. Artificial Lift Methods Introduction		
31	3		Gas Lift Methods		
32	3		Pumps Lift		

44.Course Evaluation

Score distribution out of 100:
10 marks (5 marks for each daily exam for the two semesters)
15 marks (first semester exam)
15 marks (second semester exam)
60 final exam score

45.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Oil production engineering
Main references (sources)	
Recommended books and references (scientific journals, reports...)	1- Pressure Transient Testing (Lee, SPE, 2003) 2 -Well Testing (Lee, SPE, 1982) 3- Advances in Well Test Analysis(Earlougher, 2nd, SPE, 1977) THE TECHNOLOGY OF ARTIFICIAL LIFT METHODS (Brown, , PennWell 1977)
Electronic References, Websites	

Course Description Form

46.Course Name:

Petroleum Production Engineering I

47.Course Code:
PEN20307
Semester / Year:
annual
Description Preparation Date:
20/3/2024
Available Attendance Forms:
Presence
Number of Credit Hours (Total) / Number of Units (Total)
60/2

48. Course administrator's name (mention all, if more than one name)

Name: A. M . Dr. Jawad Radhi Al-Asal Email: Jawad.r. rustum@uoalkitab.edu.iq

49.Course Objectives

Course Objectives	

50.Teaching and Learning Strategies

Strategy	Objectives of the study subject 1- Preparing competent cadres in the field of petroleum engineering. 2- Contributing to the development of cadres working in the field of petroleum engineering in state institutions and departments. 3- Developing the scientific and practical capabilities and expertise of engineers and technicians working in the field of petroleum engineering.

51. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2	A- Cognitive objectives 1 -The possibility of applying knowledge in the field of mathematics, science and engineering. 2 -Reliable for designing analyses, in addition to analyzing and deriving the desired results.	**Ch 1: Well Completion Operations Introduction**	Civilized discussion, advice, guidance, and guidance of students on an ongoing basis.	Conducting daily tests, monthly and annual examinations, requesting daily practical reports, projects and research.
2	2		Factors influencing completion design		
3	2		Types of Well Completion 1		
4	2		Types of Well Completion 2		
5	2		Equipment of Well Completion, Program &control of Well Completion		
6	2		Perforating Oil& Gas Wells		
7	2		Completion Efficiency 1		

8	2	3 -Reliable in designing a system or part of the new Austria system to meet basic needs within research tools, such as economics, sociology, politics, professional computer ethics, and microphone capability. 4 -Understanding professional and ethical responsibility. 5 -The ability to communicate efficiently. 6 -General culture to understand the impact of overall engineering solutions from an economic, social, and environmental perspective. B- Program-specific skills 1 -Modern designs that enable you to use effects, skills, engineering tools, and engineering design drawings. 2 -Reliable in defining engineering problems and solving them. 3 -Economical in employment and homogeneity with multiple differences. Chapter One: Complete the oil wells Introduction to discussing civilization in a form and providing advice and guidance to students. It experiences daily clothing tests, monthly and annual examinations, and is informed of daily	**Ch 2: Coning Problems Introduction**		
9	2		Vertical well critical rate correlations-The Meyer-Garder Method		
10	2		Vertical well critical rate correlations-Chaney et al. Method		
11	2		Breakthrough time-The Sobocinski-Cornelius Method		
12	2		**Ch 3: DST& Types of Well Test Introduction**		
13	2		Procedure of DST		
14	2		Pressure Build Up(BP) Analysis		
15	2		Res. Parameters obtained by BP analysis		
16	2		Res. &Fluid Anomaly Indications		
17	2		**Ch.4 Helical Buckling** Introduction		
18	2		Packers Permitting Free Motion		
19	2		Packers Permitting Limited motion		
20	2		Packers Permitting No Motion		
21	2		**Ch 5: Surface Gathering System Introduction**		
22	2		Types of Gathering System		
23	2		Parts of gathering System		
24	2		Maintains of SGS		
25	2		**Ch 6: Oil& Gas Separators Introductions**		
26	2		Types of Separators		
27	2		Vertical Separators calculations		
28	2		Horizontal, & Spherical Separators calculations		
29	2		**Ch : Oil Storage Tank**		
30	2		Types of Oil Tank		
31	2		Parts of Oil Tanks		
32	2		Maintains of Tank		

		reports, science and research.			

52. Course Evaluation
Score distribution out of 100 10 marks (5 marks for each daily exam for the two semesters) 15 marks (first semester exam) 15 marks (second semester exam) 60 final exam score

53. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Oil production engineering
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Methodological and source books, scientific journals and research, electronic libraries, real-life practical examples, solved questions and other unsolved enrichment questions.
Electronic References, Websites	

Course Description Form

54. Course Name: Engineering Statistcs
55. Course Code: Ens12317
56. Semester / Year: 2023-2024
57. Description Preparation Date:
58. Available Attendance Forms: Electronic & papers
59. Number of Credit Hours (Total) / Number of Units (Total)
60. Course administrator's name (mention all, if more than one name)
Name: Dr. Salim Y. Kasim Email: salim.yahya@uoalkitab.edu.iq
61. Course Objectives

Course Objectives	To develop problem solving skills and understanding of circuit theory through the application of techniques. • To understand voltage, current and power from a given circuit.

	• This course deals with the basic concept of electrical circuits. • This is the basic subject for all electrical and electronic circuits. • To understand Kirchhoff's current and voltage Laws problems. • To perform mesh and Nodal analysis.

62.Teaching and Learning Strategies

Strategy	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 TYPES OF SIMPLE EXPERIMENTS INVOLVING SOME SAMPLING ACTIVITIES THAT ARE INTERESTING TO THE STUDENTS.

63. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1 Week 2 Week3 Week4 Week 5 Week5 Week6 Week8 Week9 Week10 Week 11 Week12 Week13 Week14 Week 15 Week16	4	1. IMPORTANCE OF STATISTICS. 2. DESCRIPTIVE AND INFERENTIAL STATISTICS. 3. PICTORIAL DESCRIPTION OF DATA. 4. RANDOM SAMPLE SELECTION. 5. DATA CLASSIFICATIONS. 6. FREQUENCY DISTRIBUTIONS. 7. GRAPGICAL REPRESENTATION OF DATA HISTOGRAMS. 8. FREQUENCY POLYGON.		Civilized discussion, advice, guidance, and guidance of students on an ongoing basis.	Conducting daily tests, monthly and annual examinations, requesting daily practical reports, projects and research.

		9. MESURES OF PROBABILITY VARIATION AND THE BINOMIAL DISTRIBUTIONS. 10. POISSON DISTRIBUTION. 11. NORMAL DISTRIBUTION . 12. CORRELATION AND REGRESSION ANALYSIS.			

64.Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
65.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	Mechanics, R.C Hibbiler
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	https://ow.mit.du/courses/2-001-mechanics-materials-i-fall-2006

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programmer specification.

1. Teaching Institution	Al-Kitab University
2. University Department/Centre	Petroleum Engineering

3. Course title/code	Secondary oil recovery
4. Programme(s) to which it contributes	
5. Modes of Attendance offered	
6. Semester/Year	2019-2020
7. Number of hours tuition (total)	3
8. Date of production/revision of this specification	

9. Aims of the Course

Hydrocarbon recovery occurs through two main processes: primary recovery and supplementary recovery. Primary recovery refers to the volume of hydrocarbon produced from reservoirby the natural energy prevailing in the reservoir and/or artificial lift through a single wellbore; while supplementary or secondary hydrocarbon recovery refers to the volume of hydrocarbon produced as a result of the addition of energy into the reservoir, such as fluid injection, to complement or increase the original energy within the reservoir . Primary oil recovery mechanisms The natural driving mechanisms of primary recovery are outlined as follows. ¬ Rock and liquid expansion drive ¬ Depletion drive ¬ Gas cap drive ¬ Water drive ¬ Gravity drainage drive ¬ Combination drive Supplementary or secondary hydrocarbon recovery Secondary hydrocarbon (oil and/or gas) involves the introduction of artificial energy into the reservoir via one wellbore and production of oil and/or gas from another wellbore. Usually secondary recovery include the immiscible processes of waterflooding and gas injection or gas-water combination floods, known as water alternating gas injection (WAG), where slugs of water and gas are injected sequentially. Simultaneous injection of water and gas (SWAG) is also practiced, however the most common fluid injected is water because of its availability, low cost, and high specific gravity which facilitates injection. Enhanced Oil Recovery Tertiary or enhanced recovery refers to processes in the porous medium that recover oil not produced by the conventional primary and secondary production methods. By EOR is meant to improve the sweep efficiency in the reservoir by use of injectants that can reduce the remaining oil saturation below the level achieved by conventional injection methods. Included in remaining oil defined here are both the oil trapped in the flooded areas by capillary forces (residual oil), and the oil in areas not flooded by the injected fluid (bypassed oil). Project objectives Primary Recovery –How pressure originated from various forces in during Primary Recovery process Secondary Recovery –The purpose of a secondary recovery technique Water injection Gas injection When to start EOR? Tertiary Oil Recovery Methods

10· Learning Outcomes, Teaching ,Learning and Assessment Method

Primary Recovery ♣ Secondary Recovery ♣ Water Injection ♣ Gas Injection ♣ Limitations and disadvantages of Primary and Secondary Recovery Processes ♣ Tertiary or Enhanced Oil Recovery Methods ♣ Chemical Processes ♣ Miscible displacement methods ♣ Thermal Processes

B. Subject-specific skills

B1 The structure of this course makes your individual study and preparation outside the class extremely important. The lecture material will focus on the major points introduced in the text. Reading the assigned chapters and having some familiarity with them before class will greatly assist your understanding of the lecture. After the lecture, you should study your notes and work relevant problems .

Teaching and Learning Methods

Lecture x Group discussion x Experiential exercise x Simulation x Case analysis x Course paper Others

Assessment methods

Term 1 exam	Term 2 exam	Lab.	Total	Final Exam
20%	20%	10%	50%	50%

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1
D2
D3
D4

11. Course Structure					
Week	**Hours**	**ILOs**	**Unit/Module or Topic Title**	**Teaching Method**	**Assessment Method**
1و2و3			Geological Factors in Enhanced Oil Recovery • Reservoir heterogeneities • Examples of geological factors in enhanced recovery projects • Natural fractures	Conducting daily tests, monthly and annual examinations, requesting daily practical reports, projects and research.	Civilized discussion, advice, guidance, and guidance of students on an ongoing basis.
4و5و6			Determination of Residual Oil Saturation based on Geophysical Well logging techniques • Determination of residual saturation • Well-log-derived oil saturation determination in open hole • Residual oil saturation determination in cased wellbore		
7و8و9			Water flooding Assements of water flooding Application water flooding Criteria of water flooding Theories of water flooding		
10و11و12			Gas Injection • Predictive techniques • Reservoir performance • Gas Injection • Gas Injection in carbonate reservoirs • Inert Gas Injection • Candidates for gas injection		
13و14و15			Miscible Flooding • Sweep efficiency • High-pressure gas injection • Enriched –gas drive • Liquid petroleum gas slug drive • Predictive		

			techniques • Field applications		
16و17و18و1			Carbon Dioxide Flooding • Process description • Field projects • Carbon dioxide sources • Problem areas • Designing o CO2 flood • Guidelines for selection of miscible CO2 projects • Immiscible CO2 flooding		
19و20و21			Polymer Flooding • Polymer products and theory of use • Planning polymer flood projects		
22و23و24			Use of Surfactants in oil recovery • Classification of EOR surfactants • Mechanism of oil displacement by surfactant flooding • Factors influencing oil recovery • Surfactant-gas flooding for oil recovery • Mechanism of surfactant loss in porous media • Present status of the use of surfactants in oil recovery		
25و26و27			Steam flooding for Enhanced Oil Recovery • Screening criteria for steam flood prospects • Reservoir rock and fluid properties • Heat losses and formation heating • Oil recovery calculations • An overview of stemaflood modeling • Parametric studies in steamflooding • Economies of the steamflooding process		

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Enhanced oil recovery,latil Applied enhanced oil recovery, Carcona Aurel Carcoana, Applied Enhanced Oil Recovery, 1992 Erle C. Donaldson- Enhanced Oil Recovery, I Fundamentals and Analyses, 1985 Erle C. Donaldson- Enhanced Oil Recovery, II Processes and Operations, 1998 Marcel Latil- Enhanced Oil Recovery, 2008
Special requirements (include for example workshops, periodicals, IT software, websites)	IT software and field data
Community-based facilities (include for example, guest Lectures , internship , field studies)	Field studies and analysis data

COURSE SPECIFICATION

1. Teaching Institution	Al-Kitab University
2. University Department/Centre	Petroleum Engineering
3. Course title/code	Numerical Methods and Reservoir Simulation
4. Programme(s) to which it contributes	
5. Modes of Attendance offered	
6. Semester/Year	2019-2020
7. Number of hours tuition (total)	5
8. Date of production/revision of this specification	
9. Aims of the Course	
Study of numerical methods and learn to solve equations numerically using several methods and analysis of the results based on reducing the error rate as well as the application of these equations in the analysis and interpretation of Reservoir pressure in the cases of production and injection as well as the knowledge of the behavior of	

the reservoir future and guess reserves and production in addition to the knowledge of reservoir properties and develop models and special development plans fields

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programmer specification.

10· Learning Outcomes, Teaching ,Learning and Assessment Method

A- Knowledge and Understanding

A1 to understand numerical methods
A2 to think about what is the best method
A3 to knowledge different skills about reservoir simulation
A4

B. Subject-specific skills

B1 use software in reservoir simulation
B2 choose good idea about reservoir performance
B3 to apply different math skills
B4

Teaching and Learning Methods

To know the roots of equations, interpolation, integrals, and matrices and solving linear equations of fluid flow through porous media, study types fluid flow, with a one-dimension or two-and three, kinds of phase fluids flow

Assessment methods

11. Course Structure					
Week	**Hours**	**ILOs**	**Unit/Module or Topic Title**	**Teaching Method**	**Assessment Method**
1			Introduction	Conducting daily tests, monthly and annual examinations, requesting daily practical reports, projects and research.	Civilized discussion, advice, guidance, and guidance of students on an ongoing basis.
2			Roots of equations		
3			Graphical methods and bisection and Newton methods		
4			False position and secant methods		
5			Interpolation – linear		
6			Non linear- quadratic and polynomial methods		
7			Lagrange methods		
8			Curve fitting – least square methods		
9			Polynomial methods		
10			Regression methods		
11			Integration – trapezoidal method		
12			Simpson rule method		
13			Matrices		
14			Properties of matrices		
15و16			Solution of linear system equations –		

			Gauss 16elimination , Guess siedel , Jacobi, Gauss Jordan Matrix invesion , Thomas algorithm methods		
17			Reservoir simulation introduction		
18			Fluid flow through porous media		
19			Flow through 1-D,2-D ,and 3-D		
20			Taylor series		
21			Implicit and explicit methods		
22			Transmissibility		
23			Flow equation with transmissibility		
24			Averaging of rock and fluid properties		
25			Solution of radial flow equation		
26					

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Numerical methods,Al-Khafage-Reservoir Simulation, Abo Al-Kasim-Petroleum Reservoir Simulation , Khalid Aziz-software reservoir simulation , Boast
Special requirements (include for example workshops, periodicals, IT software, websites)	IT software and field data
Community-based facilities (include for example, guest Lectures , internship , field studies)	Field studies and analysis data

Course Description Form

66.Course Name:	
Petroleum Reservoir Eng. I	
67.Course Code:	
PEN20305	
68.Semester / Year:	
Year	
69.Description Preparation Date:	
/2024/3/25	
70.Available Attendance Forms:	
lec.	
71.Number of Credit Hours (Total) /	
Units8 hr-6Number of Units (Total)/	
72. Course administrator's name (mention all, if more than one name)	
Name:Dr.Ghassan H. Ali Email: ghassanpet@uokirkuk.edu.iq	
73.Course Objectives	
Course Objectives	• **The aim of the course is to provide students with a petro-phys properties of res. Rock and fluid properties of the res. And phases**
74.Teaching and Learning Strategies	
Strategy	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 types of simple experiments involving some sampling activities that are interesting to the students.

75. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-15 16-30	6 6	Understand key aspects of petro-physical and fluid properties of the reservoir	Petro-physical properties of res. rocks. Fluid properties	Civilized discussion, advice, guidance, and guidance of students on an ongoing .basis	Conducting daily tests, monthly and annual examinations, requesting daily practical reports, projects and .research

76. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

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	5% (5)	2 and 12	LO #3, #4 and #6, #7
	Seminars	1	2% (2)	Continuous	All
	Home Work	6	3% (3)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	20% (20)	8	LO #1 - #7
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

77. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Applied Reservoir Engineering by Craf
Main references (sources)	Applied Reservoir Engineering by Craf
Recommended books and references (scientific journals, reports...)	SPE JORNAL
Electronic References, Websites	https://www.coursera.org/browse/physical-science-an engineering/Petroleum-engineering

Course Description Form

78. Course Name:

Petroleum Reservoir Eng. II

79.Course Code:
PEN20414
80.Semester / Year:
Year
81.Description Preparation Date:
2024/3/25
82.Available Attendance Forms:
lec.
83.Number of Credit Hours (Total) /
Units Number of Units (Total)/ 4 hr-6
84. Course administrator's name (mention all, if more than one name)
Name:Dr.Ghassan H. Ali Email: ghassanpet@uokirkuk.edu.iq
85.Course Objectives

Course Objectives	• **The aim of the course is to provide students with a fundamer understanding of petroleum reservoir procedures. The course gives an overv of types of reservoir engineering (single phase gas reservoir or dry gas reserv gas condensate reservoir and undersaturated oil reservoir).....**

86.Teaching and Learning Strategies	
Strategy	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 types of simple experiments involving some sampling activities that are interesting to the students.

87. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1-5 6-10 11-15 16-20 21-25 26-30	**4 4**	**Understand key aspects of types of reservoir**	**Dry gas res. Condensate gas res Under sat. oil res. Sat. oil res. Water influx Prediction of res. performance**	**Civilized discussion, advice, guidance, and guidance of students on an ongoing basis.**	**Conducting daily tests, monthly and annual examinations, requesting daily practical reports, projects and research.**

Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

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	5% (5)	2 and 12	LO #3, #4 and #6, #7
	Seminars	1	2% (2)	Continuous	All
	Home Work	6	3% (3)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	20% (20)	8	LO #1 - #7
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

88.Learning and Teaching Resources

Required textbooks (curricular books, if any)	Applied Reservoir Engineering by Craft
Main references (sources)	Applied Reservoir Engineering by Craft
Recommended books and references (scientific journals, reports...)	SPE JORNAL
Electronic References, Websites	https://www.coursera.org/browse/physical-science-and-engineering/Petroleum-engineering

Course Description Form

1. Course Name:
Mathematics II
2. Course Code:
MAT10209
3. Semester / Year:
Year
4. Description Preparation Date:
2024/3/25
5. Available Attendance Forms:
lec.
6. Number of Credit Hours (Total) / Number of Units (Total)
6/8
7. Course administrator's name (mention all, if more than one name)
Name: Yeldez J. Subhi Email: yeldez.subhi@uoalkitab.edu.iq

8. Course Objectives	
Course Objectives	Introducing basic concepts and techniques in calculus and differential equations. Develop a solid foundation for motion along continuums, Taylor-Maclaurin series, functions of several variations, extrema, Lagrange multipliers, multiple integrals, order changes, first-order differential equations, and second-order differential equations.

9. Teaching and Learning Strategies	
Strategy	1-Lectures: Instructors may deliver lectures to introduce new concepts, explain theory, and provide examples. They may use visual aids, such as slides or whiteboards, to enhance understanding. 2-Active Learning: Engaging students in active learning strategies can promote understanding and retention. This may include problem-solving activities, group discussions, peer teaching, or hands-on experiments. 3-Problem-Solving Sessions: Dedicated problem-solving sessions can help students apply calculus concepts to practice. Instructors can guide students through example problems, challenging exercises, and step-by-step problem-solving techniques. 4-Practice Exercises: Assigning practice exercises allows students to reinforce their understanding of calculus concepts and develop problem-solving skills. Instructors may provide a set of exercises for individual or group work. 5-Real-World Applications: Demonstrating real-world applications of calculus can help students understand the relevance and practicality of the subject. Instructors may use examples from physics, engineering, economics, or other fields to illustrate how calculus is applied. 6-Technology Integration: Utilizing technology tools, such as graphing calculators, computer software, or online resources, can aid visualization, experimentation,

	and problem-solving. Instructors may incorporate these tools into lectures, assignments, or hands-on activities. 7-Formative Assessment: Regular formative assessments, such as quizzes or short assignments, can help monitor students' progress and identify areas that need further clarification or review. 8-Feedback and Discussion: Providing timely and constructive feedback on students' work is crucial for their learning. Instructors may offer individual feedback on assignments, encourage class discussions to address misconceptions, or provide opportunities for students to ask questions. 9- .Independent Study: Encouraging students to engage in independent study allows them to explore additional resources, deepen their understanding, and develop self-directed learning skills. Instructors may recommend textbooks, online tutorials, or supplementary readings. 10- Review Sessions: Before exams or assessments, review sessions can help consolidate knowledge and address any remaining questions or challenges. Instructors may recap key concepts, solve practice problems, or provide study guides. 11- Collaborative Learning: Promoting collaborative learning activities, such as group projects or study groups, can enhance students' understanding through peer interaction, collective problem-solving, and knowledge sharing. 12- Reflection and Metacognition: Encouraging students to reflect on their learning process and develop metacognitive skills can enhance their understanding and problem-solving abilities. Instructors may prompt self-reflection through questions or discussions about learning strategies, mistakes, or approaches to problem-solving.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Demonstrate an understanding of motion along curves, including differentiation and integration of vector-valued functions. Apply Taylor and Maclaurin series to approximate functions and solve real-world problems. Analyze functions of more than one variable using partial derivatives and gradients.	Exploring Polar Coordinates, plotting Basic Polar Graphs, calculating Arc Length in Polar, and determining Area in Polar Coordinates	Civilized discussion, advice, guidance, and guidance of students on an ongoing basis.	Conducting daily tests, monthly and annual examinations, requesting daily practical reports, projects and research.
2	2		Motion along Curves: Differentiation and integration of vector-valued functions (Introduction, basic concepts, advanced concepts and applications)		
3	2		Taylor and Maclaurin Series: Introduction and applications		

		Identify and find extreme values of functions of multiple variables. Apply the Lagrange multiplier method to optimize functions with constraints. Understand the concept of multiple integrals, specifically double integrals, and evaluate them. Apply techniques for changing the order of integration in multiple integrals. Solve first-order differential equations, especially separable equations. Define and classify second-order differential equations.	(Definition and basic examples)		
4	**2**		Taylor and Maclaurin Series: Applications and convergence (Error estimation and approximation)		
5	**2**		Functions of More Than One Variable: Partial derivatives and gradients (Definition and basic properties)		
6	**2**		Functions of More Than One Variable: Partial derivatives and gradients (Higher-order partial derivatives and applications)		
7	**2**		**Midterm examine**		
8	**2**		Extreme Values: Finding extreme values of functions of multiple variables (Local extrema and critical points)		
9	**2**		Extreme Values: Finding extreme values of functions of multiple variables (Global extrema and optimization problems)		
10	**2**		Lagrange Multiplier: Introduction and optimization with constraints (The Lagrange multiplier method)		
11	**2**		Lagrange Multiplier: Optimization problems with multiple constraints		
12	**2**		Multiple Integrals: Introduction and double integrals (Definition and basic properties)		

13	**2**		Multiple Integrals: Evaluation techniques for double integrals		
14	**2**		Change of Order: Changing the order of integration in multiple integrals (Introduction and basic examples)		
15	**2**		First Order Differential Equations: Introduction and separable equations (Definition and basic concepts)		
16			Final – Term exam		

11.Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	THOMAS' CALCULU EARLY TRANSCENDENTALS
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Democracy
2. Course Code:
KTB00202
3. Semester / Year:
Year
4. Description Preparation Date:
2024/3/25
5. Available Attendance Forms:
lec.
6. Number of Credit Hours (Total) / Number of Units (Total)
2/2
7. Course administrator's name (mention all, if more than one name)
Name: A. M . Dr. Jawad Radhi Al-Asal Email: Jawad.r. rustum@uoalkitab.edu.iq
8. Course Objectives

Course Objectives	The importance of the subject of human rights and democracy lies in the student's study of the most important rights contained in international norms and laws, as well as what is stated in Islamic law and the Iraqi constitutions, especially the effective constitution of 2005, as well as the student's knowledge of the international covenants issued regarding human rights, on the one hand and on the other hand. Informing the student about the experiences.

9. Teaching and Learning Strategies

Strategy	The course will use a combination of lectures, interactive discussions and solution sessions Problems to introduce students to optimization principles and techniques. Practical exercises, case studies and practical examples will be used to reinforce theoretical concepts and enhance understanding.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	**2**	Demonstrate an understanding of motion along curves, including differentiation and integration of vector-valued functions. Apply Taylor and Maclaurin series to approximate functions and solve real-world problems. Analyze functions of more than one variable using partial derivatives and gradients. Identify and find extreme values of functions of multiple variables. Apply the Lagrange multiplier method to optimize functions with constraints. Understand the concept of multiple	Definition	Civilized discussion, advice, guidance, and guidance of students on an ongoing basis.	Conducting daily tests, monthly and annual examinations, requesting daily practical reports, projects and research.
2,3	**2**		The historical and intellectual development of democracy in society		
4,5,6	**2**		Democracy in the Islamic system of government		
7	**2**		**Midterm examine**		
8,9	**2**		Contemporary political thought		
10,11	**2**		Characteristics of democracy		
12,13	**2**		Models of democracy		
14,15	**2**		Pillars of democracy		
16,17	**2**		The election		
18,19	**2**		The importance of democracy in society		
20,21	**2**		Advantages of democracy		
22,23	**2**		Defects of democracy Obstacles to implementing democracy in Iraq		
24,25,26			Forms of governments		
27,28			review		

29		integrals, specifically double integrals, and evaluate them. Apply techniques for changing the order of integration in multiple integrals. Solve first-order differential equations, especially separable equations. Define and classify second-order differential equations.	Final – Term exam		

11. Course Evaluation

First test: 20%
Test 2: 15%
Attendance and activities: 5%
Final exam: 60%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Human Rights and Democracy, Prepared by A.M.D. Ghassan Karim Majzab, A.M. Amjad Zein Al-Abidin Touma 2018
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	