University of Mosul

College of Petroleum and Mining Engineering

Department of Petroleum Reservoir Engineering

Course Descriptions

Fourth Stage / First Semester (Semester)

Dr. Maha Muneeb Al-Dabbagh

Head of Department

Dr. Ayman Mahmoud Ahmed

Chairman of the Scientific Committee

كلية هندسة النفط والتعدين
قسم هندسة المكامن النفطية

Ministry of Higher Education and Scientific Research

University of Mosul

College of Petroleum and Mining Engineering

Department of Petroleum Reservoir Engineering

Course Descriptions

Petroleum Reservoir Engineering

Fourth Stage

(Semester)

2024 – 2025

Course Description Form

1. Course Name: Enhance Oil Recovery1
2. Course Code: PRE411
3. Semester / Year: First / Fourth
4. Description Preparation Date: 25 /9/2024
5. Available Attendance Forms: In person attendance
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: dr. Muhamad A. Jassim Email: muhamed.aswad@uomosul.edu.iq

8. Course Objectives	
Course Objectives	• **Identify natural (primary) and secondary methods of oil extraction** • **Maintain reservoir pressure by adding secondary processes** • **Study the types of secondary methods and their importance in raising reservoir pressure** • **Distribute water and gas injection wells around production wells** • **Identify the most important problems that occur during injection operations and find appropriate solutions for them** • **Use tertiary methods to achieve high oil recovery…..**

9. Teaching and Learning Strategies	
Strategy	1- Direct classroom instruction, 6 hours per week + 1 hour per week for tutoring. 2- Class discussions.

	3-Tests, quizzes, class participation, projects, homework, and presentations. Student Assessment Methods: 1. Required exercises. 2. Termly exams. 3. Project discussions and assignments. The overall assessment for this course is as follows: 40 points of the total grade are allocated for annual performance, which includes assignments, oral tests, termly exams, and presentations. 60 points are allocated for the final exam.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
the 1st	3	Main extraction methods	**Enhance Oil Recovery1**	Theoretical	General questions discussion
2nd+3rd	6	Natural extraction methods	**Enhance Oil Recovery1**	Theoretical+ practical	Short exam
fourth	3	Secondary extraction methods	**Enhance Oil Recovery1**	Theoretical	General questions discussion
Fifth + sixth	6	Injection well distribution patterns	**Enhance Oil Recovery1**	Theoretical+ practical	General questions discussion
Seventh +eighth	6	Physical properties of injecti wells	**Enhance Oil Recovery1**	Theoretical+ practical	homework
Ninth	3	Main types of injection	**Enhance Oil Recovery1**	Theoretical	Short exam
The tenth + eleventh	6	Water injection	**Enhance Oil Recovery1**	Theoretical+ practical	General questions discussion
twelfth	3	Injection water sources	**Enhance Oil Recovery1**	Theoretical	**classwork**
Thirteenth+ fourteenth	6	Water injection patterns and methods	**Enhance Oil Recovery1**	Theoretical+ practical	General questions discussion
fifteenth	3	Injection water treatment	**Enhance Oil Recovery1**	Theoretical	Short 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)	Introduction to Petrophysics of Reservoir Rocks
Main references (sources)	Petroleum Reservoir Engineering Handbo Tark Ahmad, 4th edition 2010
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Head of department

Lecturer

Course Description Form

1. Course Name:
Reservoir Characterization / 4th Class / Dept. of Petroleum Reservoir Engineering
2. Course Code:
PRE412
3. Semester / Year:
First semester / 2024 – 2025
4. Description Preparation Date:
1/9/2024
5. Available Attendance Forms:
Classroom attendance for theoretical and practical material
6. Number of Credit Hours (Total) / Number of Units (Total)
6 hours (2 theoretical + 3 practical) / 3.5 units
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Ayman Mahmoud Ahmed (Lecturer) Email: ayman.geology@uomosul.edu.iq
8. Course Objectives

Course Objectives	● This course aims to teach the student how to utilize temporal seismic sections to infer sedimentary facies and the likelihood of oil being present. ● Know the architecture of the reservoir. ● Inferring the geological history of the area to analyze the petroleum system of the reservoir and effective for exploration.

9. Teaching and Learning Strategies

Strategy	Developing study programs that link reservoir characterization with other disciplines within reservoir engineering that contribute to solving scientific issues. Provide the local and regional community with an oil reservoir engineer with a broad theoretical and practical background, including oil reservoir characterization. Emphasize the role of scientific field and laboratory research, modeling, and geophysical studies in solving issues.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	2 hrs.	The ability to identify, assess, and solve engineering problems using the basic knowledge acquired in engineering, science, and mathematics.	Seismo-Stratigraphic Interpretation Depositional Systems Its Role In Petrole Exploration Integra Expertise for Reser Characterization Unconventional Resou in the Hydrocar Industry Compartmentalization oil and gas reserv Scales and Styles Geologic Reser Heterogeneity Apply Reservoir Characterizat	Theoretical	General questic and discussion c real-time quiz
2	2 hrs.	The ability to identify, assess, and solve engineering problems using the basic knowledge acquired in engineering, science, and mathematics.	Geologic Significance Seismic Reflecti Amplitude variation v offset(lithologies, flu gases, porosities, pressures) understanding of the eff of lithology and spacing on reflec parameters amplitu frequency, continuity reflections Parallelism reflection cycles to g bedding, and therefore physical surfaces separate older f younger sedim Reflection configuratio	Theoretical	General questi nd discussion eal-time quiz
3	2 hrs.	The ability to identify, asses and solve engineering problems using the basic knowledge acquired in engineering, science, and mathematics.	Seismic Reflections Time-Stratigraphy	Theoretical	General questi nd discussion eal-time quiz
4	2 hrs.	The ability to identify, assess, and solve engineering problems using the basic knowledge acquired in engineering, science, and mathematics.	The Seismic Stratigra Approaches Seis stratigraphy is o divided into several areas Analysis of seis sequence Analysis seismic facies Analysis reflection character	Theoretical	General questi nd discussion eal-time quiz
5	2 hrs.	The ability to identify, ass and solve engineering probl using the basic knowle acquired in engineer science, and mathematics.	Recognition Discrimination Depositional Sequen Boundaries of Depositi Sequences, Definition Seismic Facies, Princ Types of Seismic Fac	Theoretical	General questic Discussion monthly exam

			Stratigraphic interpreta of Seismic facies.		
6	2 hrs.	The ability to identify, assess, and solve engineering problems using the basic knowledge acquired in engineering, science, and mathematics.	Unconformities Recognized By Reflection Terminations, Factors Controlling Deposition of Cyclic Sequences. Chrono - stratigraphy construction & interpretation Chronostratigraphic significance of seismic reflections.	Theoretical	General questions and discussion or real-time quiz
7	2 hrs.		Geology and Geometry of Depositional Systems, sea level curves, accommodation space , and cycle orders	Th eor eti cal	General questions and discussion or real-time quiz
8	2 hrs.	The ability to acquire new engineering knowledge and skills in engineering fields.	Carbonate sequences.	Theoretical	General questions and discussion or real-time quiz
9	2 hrs.	The ability to acquire new engineering knowledge and skills in engineering fields.	Siliciclastic sequences	Theoretical	General questions and discussion or real-time quiz
10	2 hrs.	The ability to acquire new engineering knowledge and skills in engineering fields.	Seismic facies & Paleo-environmental analysis	Theoretical	General questions and discussion or real-time quiz
11	2 hrs.	The ability to acquire new engineering knowledge and skills in engineering fields.	Geo-history reconstruction	Theoretical	General questions and discussion or real-time quiz
12	2 hrs.	The ability to acquire new engineering knowledge and skills in engineering fields.	Optimizing exploration & development	Theoretical	General questions and discussion or real-time quiz
13	2 hrs.	The ability to acquire new engineering knowledge and skills in engineering fields.	Review of Seismic Stratigraphy	Theoretical	General questions and discussion or real-time quiz
14	2 hrs.	The ability to acquire new engineering knowledge and skills in engineering fields.	VSP.A measurement that transfer Geology To Geophysics	Theoretical	General questions and discussion or real-time quiz

15	2 hrs.	The ability to acquire new engineering knowledge and skills in engineering fields.	VSP.A measurement that transfer Geology To Geophysics	Theoretical	General questions and discussion + final of semester exam.
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	3 hrs.	The ability to work within multidisciplinary teams to analyze problems, solve them, and meet deadlines.	Lab-1/ Preparation of stratigraphic columns	Practical	Solution with lab report
2	3 hrs.	• The ability to acquire new engineering knowledge and skills in engineering fields.	Lab-2/ preparation of stratigraphic columns	Practical	Solution with lab report
3	3 hrs.	• The ability to identify, assess, and solve engineering problems using the basic knowledge acquired in engineering, science, and mathematics.	Lab-3 / Seismic Stratigraphy termination	Practical	Solution with lab report
4	3 hrs.	• The ability to acquire new engineering knowledge and skills in engineering fields.	Lab-4 / Seismic Stratigraphy termination	Practical	Solution with lab report
5	3 hrs.	• The ability to identify, assess, and solve engineering problems using the basic knowledge acquired in engineering, science, and mathematics.	Lab-5 / Principle reflection patterns	Practical	Solution with lab report
6	3 hrs.	• The ability to work within multidisciplinary teams to analyze problems, solve them, and meet deadlines.	Lab-6 / ABC technique The Classic Method - an Example	Practical	Solution with lab report + monthly exam
7	3 hrs.	• The ability to work within multidisciplinary teams to analyze problems, solve them, and meet deadlines.	Lab-6 / frequencies, wavelengths, velocities synthetic seismogram	Practical	Solution with lab report
8	3 hrs.	• The ability to acquire new engineering knowledge and skills in engineering fields.	Lab-7 / frequencies, wavelengths, velocities synthetic seismogram	Practical	Solution with lab report
9	3 hrs.	• The ability to identify, assess, and solve engineering problems using the basic knowledge acquired in engineering, science, and mathematics.	Lab-8/ Map TDC using Average Velocity	Practical	Solution with lab report

10	3 hrs.	• The ability to acquire new engineering knowledge and skills in engineering fields.	Lab-9/ Map TDC using Average Velocity	Practical	Solution with lab report
11	3 hrs.	• The ability to work within multidisciplinary teams to analyze problems, solve them, and meet deadlines.	Lab-10 / Section TDC using Interval Velocity Layer-Cake Method	Practical	Solution with lab report
12	3 hrs.	• The ability to identify, assess, and solve engineering problems using the basic knowledge acquired in engineering, science, and mathematics.	Lab-11 / Section TDC using Interval Velocity Layer-Cake Method	Practical	Solution with lab report
13	3 hrs.	• The ability to work within multidisciplinary teams to analyze problems, solve them, and meet deadlines.	Lab-12/ Identification of different types of sedimentary facies from seismic time sections.	Practical	Solution with lab report
14	3 hrs.	• The ability to acquire new engineering knowledge and skills in engineering fields.	Lab-13/ Using printed time sections & Digital by software (Schlumberger Petrel).	Practical	Solution with lab report
15	3 hrs.	• The ability to identify, assess, and solve engineering problems using the basic knowledge acquired in engineering, science, and mathematics.	Lab-14/ Practical Seismic Interpretation for Petroleum Exploration Seismic Lab Exercises with Solutions Find the oil and interpretation exercise.	Practical	Solution with lab report + final exam

11. Course Evaluation

Distribute the score out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly and written exams, reports, etc.
The semester grade is 50%, including 35% theoretical, including attendance, class discussions, quizzes, and lab reports, and 15% practical.
The end-of-semester grade is 50%, including 40% theory and 10% practical.

12. Learning and Teaching Resources

Required textbooks (curricular books, if a	Seismic stratigraphy, An Integrated Approach . By: Berg,O.R.& Woolverton, D.G.,AAPG Memoir 39 (1985). Seismic Stratigraphic Interpretation And Petroleum Exploration ,1984 By Brown ,L.F. And Fisher ,W.L., AAPG .

Main references (sources)	Seismic –Stratigraphic Interpretation Of Depositional Systems. Examples From Brazilian Rift And Pull-Apart Basins .By Brown &Fisher ,1977
Recommended books and references (scientific journals, reports…)	Seismic Stratigraphy –Applications To Hydrocarbon Exploration By Payton,C.E.1977 Vertical Seismic Profiling Technique Applications &Case Histories By Balch,A.H. And Lee,M.W.(1984) Reidel Scheriff, Seismic Stratigraphy
Electronic References, Websites	AAPG,54:1184-1224 AAPG, 57:878-886 AAPG, 57:1185-1218 AAPG,63:1999-2020 AAPG,48:317-328 AAPG,62:742-812.
Curriculum Update Percentage or Description	7%

Head of department Lecturer

Course Description Form

1. Course Name:

Reservoir Modeling

2. Course Code:

PRE413

3. Semester / Year:

First/ 2024-2025

4. Description Preparation Date:

10/ 9/ 2024

5. Available Attendance Forms:

Blended

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

75/3.5

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

Name: Dr. Maha Muneeb Mahmood
Email: mahamuneeb@uomosul.edu.iq

8. Course Objectives

Course Objectives	• Teach the basic concepts and techniques for the construction of a computer model of a petroleum reservoir. • Build a 3D geological and petrophysical models using static data. • Integrating geological, geophysical, and petrophysical data into a 3D description of a reservoir.

9. Teaching and Learning Strategies

Strategy	Giving lectures (ppt) Discussion E-Learning Brainstorming

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject Name	Learning Method	Evaluation Method
1	2	Define and describe Reservoir modelling	Introduction	Giving Lectures + discussion	Asking and discussion questions
2	2	List and label uses of reservoir modelling	The Uses of Reservoir Modelling	Giving Lectures + discussion	Asking and discussion questions
3	2	Create workflow plan and define key elements of reservoir model	The Modelling Workflow and Key Elements of Reservoir Modelling	Giving Lectures + discussion	Quiz

4	2	Compare between static and dynamic reservoir's properties	Static and Dynamic Properties of Reservoirs	Giving Lectures + discussion	Asking and discussion questions
5	2	List and describe the resources data	The Resolution and Resources of Data	Giving Lectures + discussion	Asking and discussion questions
6	2	Define seismic and dynamic data	Seismic Data, Dynamic Data	Giving Lectures + discussion	Quiz
7	2		Exam		
8	2	Recognize heterogeneities in reservoir	Introduction to Heterogeneities in Reservoir and in Petrophysical Properties	Giving Lectures + discussion	Asking and discussion questions
9	2	Summarize the types of reservoir models	Types of Reservoir Models	Giving Lectures + discussion	Asking and discussion questions
10	2	Explain and design a structural model	Structural Model and Seismic Interpretation	Giving Lectures + discussion	Quiz
11	2	List and describe the types of structural model	Structural Modeling Types	Giving Lectures + discussion	Asking and discussion questions
12	2	Explain and design a stratigraphic model	Stratigraphic Model	Giving Lectures + discussion	Asking and discussion questions
13	2	Explain and design a geocellular model	Geocellular Model	Giving Lectures + discussion	Quiz
14	2	Explain and design a property model	Property Model	Giving Lectures + discussion	Apply the software
15	2	Explain and design a facies model	Facies Model	Giving Lectures + discussion	Apply the software

Practical Part	
Week 1	Lab 1: Using Didger software to digitize contour map.
Week 2	Lab 2: Insert input data to Petrel software
Week 3	Lab 3: Build surfaces and grid
Week 4	Lab 4: Build layering
Week 5	Lab 5: Build structural Model
Week 6	Lab 6: Build Property Model
Week 7	Lab 7: Scaling up

11. Course Evaluation

Theoretical material (35% divided between 25% monthly exam, 5% daily exam, and 5% student attendance) + 40% final exam. **Practical material** (15% divided between 10% monthly exam and 5% assignments and reports) + 10% final exam.

12. Learning and Teaching Resources

Required textbooks.	
Main references (sources)	1- **Reservoir Modelling: A Practical Guide** by Steve Cannon, 2018.
Recommended books and references (scientific journals, reports…)	1- Reservoir Model Design: A Practitioner's Guide by Philip Ringrose and Mark Bentley, 2015. 2- Geostatistical Reservoir Modeling by Michael J. Pyrcz and Clayton V. Deutsch, 2014.
Electronic References, Websites	https://www.youtube.com/watch?v=bfkE2ozt64&list=PLiIO8Yqo6LD0t2RNDxSAtI0SkdU01-Kz9&index=3 https://www.youtube.com/@user-fj8yw3fk6e/playlists https://www.youtube.com/@Elmahdycity

Head of department

Lecturer

Course Description Form

1. Course Name:

Advanced petroleum reservoir engineering

2. Course Code:

PRE419

3. Semester / Year:

Second 2024-2025

4. Description Preparation Date:

04/09/2024

5. Available Attendance Forms:

Attendance

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

75/3.5

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

Name: Bushra Abdullah Mohammed
Email: geobushra @uomosul.edu.iq

8. Course Objectives

Course Objectives	● This course deals with the basic concept of fractured reservoirs ● Developing skills to identify the types of fractures that form in oil formations ● Understanding and analyzing fractured oil reservoirs ● Identifying the geological condition ● Understanding and identifying natural and hydraulic fractures of hydrocarbon reservoirs ● Understanding fluid flow in fractured rocks

9. Teaching and Learning Strategies

Strategy	The main strategy that will be followed in delivering this unit is to encourage students to participate in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through interactive classes and lessons and by looking at the types of simple experiments that involve some sampling activities that interest students.

10. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
Week1	5	Introduction.		Theoretical+ + practica	General questions
Week2	5	What is a fracture?		Theoretical+ + practica	and discussion
Week3	5	Origin of fracture			
Week4	5	Types of fracture (joint an		Theoretical+ practical	
		fault)		Theoretical+ practical	General questions
Week5	5	Classification of fracture (joint and)		Theoretical+ practical	and exam
Week6	5			Theoretical+ practical	

		Geological condition of fracturing			General questions
Week7	5				and discussion
		Fracture detection and			
Week8	5	evaluation			Monthly exam
		naturally fractured reserv		Theoretical+	
Week9	5	(carbonate ,shale and sand		practical	Group discussion
		reservoir)		Theoretical+	and assignments
Week10	5			practical	General questions
		Hydraulic fractured			
Week11	5	reservoir			Discussion and
		fluid Flow in Non-Porous			presentation
		Fractured		Theoretical+	General questions
Week12	5	rock		practical	
		Fluid Flow in Fractures Ro		Theoretical+	
Week13	5	of		practical	
		Double Porosity			Discussion and
Week14	5	Fluid Displacement in sing		Theoretical+	presentation
		Matrix		practical	
		Block		Theoretical+	
Week15	5	Production mechanism of		practical	
		Fractured			
		Reservoirs.			
				Theoretical+	
				practical	
					Discussion and
					presentation
					Discussion and
					presentation

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 any)	Fundamentals of Fractured Reservoir Engineering, by T.D. VAN GOLF-RACHT, 1982
Main references (sources)	Fundamentals of Fractured Reservoir Engineering, by T.D. VAN GOLF-RACHT, 1982
Recommended books and references (scientific journals, reports...)	Tarek_Ahmed_Reservoir_Engineering_Handbook _3Ed_2006_pdf
Electronic References, Websites	https://www.mdpi.com/1996-1073/12/15/2897

Head of department

Lecturer

Course Description Form

1. Course Name:
Core Analysis – Grade fourth
2. Course Code:
PRE415
3. Semester / Year:
First Semester 2024/2025
4. Description Preparation Date:
3/9/2024
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours:
(60) / Number of Units (3)
7. Course administrator's name (mention all, if more than one name)
Name: Saad Waleed Saadi (Lecturer) / saad.saadi@uomosul.edu.iq Name: Bushra Abdullah Mohammed (Lecturer) / geobushra@uomosul.edu.iq
8. Course Objectives

Course Objectives	● Understanding Rock Properties: Studying different types of rocks (igneous, sedimentary, metamorphic) and their physical and chemical properties. ● Studying Mineral Composition: Analyzing the mineral composition of rocks and how this composition affects the physical and mechanical properties of the rocks. ● Laboratory Analysis Techniques: Learning various laboratory techniques used in rock analysis, such as chemical analysis, mineralogical analysis, and petrographic studies. ● Linking Geological Analysis to Earth Processes: Understanding the relationship between rock formation and geological processes such as tectonics, volcanism, sediment accumulation, and thermal and pressure transformations. ● Practical Applications: Using rock analysis techniques to interpret the geological environment and the field transformation processes of rocks. This may include applications in fields such as mineral exploration, geotechnical engineering, and natural resource management. ● Rock Strength Evaluation: Analyzing the hardness and durability of rocks and determining how these properties affect their use in engineering or mining projects.

9. Teaching and Learning Strategies

Strategy	Integrating theoretical learning with practical training to provide

	students with a comprehensive and in-depth understanding of the physical and chemical properties of rocks and methods of analyzing them, through interactive and experiential learning, the use of technology, and the utilization of diverse resources

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	2	An ability to outline and conduct experiments as well as analyze and interpret data.	Introduction and Core Analysis Requirements	Theory	Group discussion
Week 2		An ability to acquire new engineering knowledge and skills in the engineering fields	Coring System and Types of Coring		Assessment exam + discussion
Week 3		An ability to acquire new engineering knowledge and skills in the engineering fields	Sidewall Coring		Assessment exam
Week 4		An ability to outline and conduct experiments as well as analyze and interpret data	Core Description and Imaging		Seminar
Week 5		An ability to outline and conduct experiments as well as analyze and interpret data	Sample Selection for Core Analysis		Classroom discussion
Week 6		An ability to outline and conduct experiments as well as analyze and interpret data	Routing Core Analysis – Modul 1		Discussion + quiz
Week 7		An ability to acquire new engineering knowledge and skills in the engineering fields	Routing Core Analysis – Modul 2		Quiz or discussion
Week 8		An ability to acquire new engineering knowledge and skills in the engineering fields	Wellsite Activities and Core Analysis Preparation		Quiz or discussion
Week 9		An ability to acquire new engineering knowledge and skills in the engineering fields	Special Core Analysis – Module 1		Quiz or discussion
Week 10		An ability to acquire new engineering knowledge and skills in the engineering fields	Special Core Analysis – Module 2		Quiz or discussion
Week 11		An ability to acquire new engineering knowledge and skills in the engineering fields	Core Management		Quiz or discussion
Week 12		An ability to outline and conduct experiments as well as analyze and interpret data	Planning a Coring Program		Quiz or discussion
Week 13		An ability to outline and conduct experiments as	Wellsite Core Handling Procedures and Preservations		Quiz or discussion

		well as analyze and interpret data			
Week 14		An ability to outline and conduct experiments as well as analyze and interpret data	Advanced Core Analysis Tests - 1		Quiz or discussion
Week 15		An ability to acquire new engineering knowledge and skills in the engineering fields	Advanced Core Analysis Tests - 2		General questions and final exam
Core Analysis - Practical					
Weeks	Hours	**Required Learn Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
Week 1	3	An ability to function on multi-disciplinary teams to analyze, solve problems, and deadline commits	Introduction to core analysis tools	Practical	Practical assessment
Week 2		An ability to function on multi-disciplinary teams to analyze, solve problems, and deadline commits	Rock Samples and Identification		Electronic report
Week 3		An ability to function on multi-disciplinary teams to analyze, solve problems, and deadline commits	Laboratory Tools for Rock Analysis		Report + exam
Week 4		An ability to acquire new engineering knowledge and skills in the engineering fields	Testing Rock Hardness with Mohs Hardness Scale		Report
Week 5		An ability to acquire new engineering knowledge and skills in the engineering fields	Sedimentary Rock Analysis		Discussion report
Week 6		An ability to acquire new engineering knowledge and skills in the engineering fields	Data Interpretation and Rock Analysis Conclusions		Report
Week 7		An ability to function on multi-disciplinary teams to analyze, solve problems, and deadline commits	Core Analysis Reports – 1		Report discussion
Week 8		An ability to function on multi-disciplinary teams to analyze, solve problems, and deadline commits	Core Analysis Reports – 2		Report discussion
Week 9		An ability to function on multi-disciplinary teams to analyze, solve problems, and deadline commits	Presentation – Group Work		Report discussion
Week 10		An ability to acquire new engineering knowledge	Porosity Problems		Report discussion

		and skills in the engineering fields			
Week 11		An ability to acquire new engineering knowledge and skills in the engineering fields	Permeability Problems		Electronic activities
Week 12		An ability to acquire new engineering knowledge and skills in the engineering fields	Water Saturation Problems		Electronic activities
Week 13		An ability to acquire new engineering knowledge and skills in the engineering fields	Advanced Core Analysis Problems - 1		Homework report
Week 14		An ability to acquire new engineering knowledge and skills in the engineering fields	Advanced Core Analysis Problems - 2		Homework report
Week 15		An ability to function on multi-disciplinary teams to analyze, solve problems, and deadline commits	Practical test		Final exam

11.Course Evaluation

- Semester Grade: 50%, which includes:

- 35% theoretical, covering attendance, classroom discussions, short exams, and practical lab reports.
- 15% practical.
- Final Exam Grade: 50%, which includes:

- 40% theoretical
- 10% practical.

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	The Fundamental of Core Analysis, Keelan, 1989
Main references (sources)	Recommended Practices for Core Analysis, API, 1989 Best Practice in Coring and Core Analysis, Mcrphee, 2015
Recommended books and references (scientific journals, reports...)	Sciencedirect/ Core analysis
Electronic References, Websites	MIT OpenCourseWave YouTube/Core Analysis
Curriculum or syllabus update percentage	8%

Head of department Lecturer

University of Mosul

College of Petroleum and Mining Engineering

Department of Petroleum Reservoir Engineering

Course Descriptions

Fourth Stage / 2nd Semester (Semester)

Dr. Maha Muneeb Al-Dabbagh

Head of Department

Dr. Ayman Mahmoud Ahmed

Chairman of the Scientific Committee

Course Description Form

1. Course Name: **Enhance Oil Recovery2**
2. Course Code: PRE417
3. Semester / Year:
Second / 2024-2025
4. Description Preparation Date:
5−1−2025
5. Available Attendance Forms: **In person attendance**
6. Number of Credit Hours (Total) / Number of Units (Total) **75**/3
7. Course administrator's name (mention all, if more than one name)
Name: dr. Muhamad A. Jassim Email: muhamed.aswad@uomosul.edu.iq
8. Course Objectives

Course Objectives	● **Identify natural (primary) and secondary methods of oil extraction** ● **Maintain reservoir pressure by adding secondary processes** ● **Study the types of secondary methods and their importance in raising reservoir pressure** ● **Distribute water and gas injection wells around production wells** ● **Identify the most important problems that occur during injection operations and find appropriate solutions for them** ● **Use tertiary methods to achieve high oil recovery**…..

9. Teaching and Learning Strategies

Strategy	1- Direct classroom instruction, 6 hours per week + 1 hour per week for tutoring.

	2- Class discussions. 3-Tests, quizzes, class participation, projects, homewo and presentations. Student Assessment Methods: 1. Required exercises. 2. Termly exams. 3. Project discussions and assignments. The overall assessment for this course is as follows: 40 points of the total grade are allocated for annual performance, which includes assignments, oral tests, termly exams, and presentations. 60 points are allocated for the final exam.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
the 1st	3	Gas injection	**Enhance Oil Recovery2**	Theoretical	General questions a discussion
2nd+3rd	6	Injection gas sources	**Enhance Oil Recovery2**	Theoretical+ practical	Short exam
fourth	3	Gas injection patterns and methods	**Enhance Oil Recovery2**	Theoretical	General questions a discussion
Fifth + sixth	6	Treatment of gas injection	**Enhance Oil Recovery2**	Theoretical+ practical	General questions a discussion
Seventh +eighth	6	Tertiary methods	**Enhance Oil Recovery2**	Theoretical+ practical	homework
Ninth	3	Chemical methods	**Enhance Oil Recovery2**	Theoretical	Short exam
The tenth + eleventh	6	Polymer injection	**Enhance Oil Recovery2**	Theoretical+ practical	General questions a discussion
twelfth	3	Alkali injection	**Enhance Oil Recovery2**	Theoretical	**classwork**
Thirteenth+ fourteenth	6	Thermal methods	**Enhance Oil Recovery2**	Theoretical+ practical	General questions a discussion
fifteenth	3	Hot steam injection	**Enhance Oil Recovery2**	Theoretical	Short 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)	Introduction to Petrophysics of Reservoir Rocks
Main references (sources)	Petroleum Reservoir Engineeri Handbook, Tark Ahmad, 4th editi 2010
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Head of department

Lecturer

Course Description Form

1. Course Name:	
Reservoir Simulation – Fourth grade	
2. Course Code:	
PRE418	
3. Semester / Year:	
Second semester 2024-2025	
4. Description Preparation Date:	
3/9/2024	
5. Available Attendance Forms:	
Attendance	
6. Number of Credit Hours (Total) / Number of Units (Total):	
Total hours 60 / total unit 3.5	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Saad Waleed Saadi Email: saad.saadi@uomosul.edu.iq	
8. Course Objectives	
Course Objectiv	● Understanding the fundamental concepts of reservoir simulation. ● Understanding the mathematical and engineering methods for reservoir simulation. ● Understanding partial differential equations (PDEs) in simulation. ● Ability to simulate single-phase and multiphase fluid flows in petroleum reservoirs. ● Testing hypotheses in practical simulations of oil fields. ● Handling wells completed in single-layer and multilayer formations, and presenting fluid flow rate equations for various well operating conditions. ● Understanding initial and boundary conditions. ● Gaining knowledge about different coordinate systems used in reservoir simulation.
9. Teaching and Learning Strategies	
Strategy	The strategy focuses on thoroughly understanding the fundamental concepts, applying them using simulation tools, and actively participating in hands-on training with real-world scenarios. Time management, collaboration with peers, and staying up to date with industry developments will also enhance your understanding and performance. By breaking tasks into manageable steps, effectively troubleshooting, and practicing consistently, students will be able to comprehend both the theoretical and practical aspects of reservoir simulation.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	2	An ability to acquire new engineering knowledge and skills in the engineering fields	Learning Principles of simulation and modelling, simulation objectives, methodology and steps	Theory	Group discussion
Week 2		An ability to acquire new engineering knowledge and skills in the engineering fields	Modelling concepts and system simulation		Assessment exam discussion
Week 3		An ability to acquire new engineering knowledge and skills in the engineering fields	Purpose and benefits of numerical reservoir simulation		Assessment exam
Week 4		An ability to acquire new engineering knowledge and skills in the engineering fields	Reservoir simulation relationships with other exploration and production matters		Seminar
Week 5		An ability to acquire new engineering knowledge and skills in the engineering fields	Types of reservoir simulation models		Classroom discussion
Week 6		An ability to acquire new engineering knowledge and skills in the engineering fields	The fluid flow equations in a porous media		Discussion + quiz
Week 7		An ability to acquire new engineering knowledge and skills in the engineering fields	Conversation of mass and conversation of momentum equations		Discussion + quiz
Week 8		An ability to acquire new engineering knowledge and skills in the engineering fields	Darcy's law and its applications		Discussion + quiz
Week 9		An ability to acquire new engineering knowledge and skills in the engineering fields	Compositional and black oil model equations		Discussion + quiz
Week 10		An ability to acquire new engineering knowledge and skills in the engineering fields	Numerical Discretization of the Fluid Flow Equations		Discussion + quiz
Week 11		An ability to acquire new engineering knowledge and skills in the engineering fields	Notions about Finite Differences and Finite elements		Discussion + quiz
Week 12		An ability to acquire new engineering knowledge and skills in the engineering fields	Types of Numerical Schemes: a) IMPES. b) Fully Implicit. c) Streamlines.		Discussion + quiz
Week 13		An ability to acquire new engineering knowledge and skills in the engineering fields	General form of the one-phase, one-dimensional, horizontal PDE		Discussion + quiz

Week 14		An ability to acquire new engineering knowledge and skills in the engineering fields	Coordinate systems in reservoir simulation		Discussion + quiz
Week 15		An ability to acquire new engineering knowledge and skills in the engineering fields	Equation of state, Conversation of Mass, Conversion of Momentum		General questions final exam
Reservoir Simulation – Practical					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
Week 1	3	An ability to function on multi-disciplinary teams to analyze, solve problems, and deadline commits.	Tutorial on Practical Use of Reservoir Simulation – CMG Software		Practical application on computer
Week 2		An ability to design an integrated system and its various components and processes to produce solutions that fulfill the needs of society.	Data gathering, geological model and grid construction – Modul 1		Practical application on computer
Week 3		An ability to design an integrated system and its various components and processes to produce solutions that fulfill the needs of society.	Data gathering, geological model and grid construction – Modul 2		Practical application on computer
Week 4		An ability to design an integrated system and its various components and processes to produce solutions that fulfill the needs of society.	Data gathering, geological model and grid construction – Modul 3		Practical application on computer + Exam
Week 5		An ability to design an integrated system and its various components and processes to produce solutions that fulfill the needs of society.	Data filtering, data input and model correction		Report + Discussion
Week 6		An ability to design an integrated system and its various components and processes to produce solutions that fulfill the needs of society.	Model run and visualization – Module 1		Practical application on computer + Exam
Week 7		An ability to design an integrated system and its various components and processes to produce solutions that fulfill the needs of society.	Model run and visualization – Module 2		Practical application on computer + Exam
Week 8		An ability to function on multi-disciplinary teams to analyze, solve	Model refinement		Practical application on computer + Exam

		problems, and deadline commits.			
Week 9		An ability to function on multi-disciplinary teams to analyze, solve problems, and deadline commits.	Fluid and rock-fluid properties, aquifer modelling and initialization		Practical application on computer + Exam
Week 10		An ability to function on multi-disciplinary teams to analyze, solve problems, and deadline commits.	Well description, history matching and forecast simulation		Practical application on computer + Exam
Week 11		An ability to function on multi-disciplinary teams to analyze, solve problems, and deadline commits.	Basic exercises about finite difference discretization.		Practical application on computer + Exam
Week 12		An ability to function on multi-disciplinary teams to analyze, solve problems, and deadline commits.	Modify and run with Eclipse/CMG software a vertical cross-section model to mimic reservoir		Practical application on computer + Exam
Week 13		An ability to function on multi-disciplinary teams to analyze, solve problems, and deadline commits.	Analyze input data and results of a 3D full field simulation model with different scenarios		Practical application on computer + Exam
Week 14		An ability to function on multi-disciplinary teams to analyze, solve problems, and deadline commits.	Retesting the model		Practical application on computer + Exam
Week 15		An ability to function on multi-disciplinary teams to analyze, solve problems, and deadline commits.	Practical test		Final course exam

11. Course Evaluation

This includes daily preparation, quizzes (written and oral), monthly exams, written tests, reports, etc.

- Midterm Grade – 50%
  - 35% Theoretical, which includes attendance, classroom discussions, short quizzes, and laboratory reports.
  - 15% Practical
- Final Exam – 50%
  - 40% Theoretical
  - 10% Practical

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1- Reservoir Simulation: Mathematical Techniques in Oil Recovery, Z.Chen,2007 2- Practical Enhanced Reservoir Engineering: Assisted with Simulation Software, Abdus Sattar,
Main references (sources)	Petroleum Reservoir Simulation:

	The Engineering Approach, Second edition, Jamal H. Abou-Kassem M. Rafiqul Islam S.M. Farouq Ali
Recommended books and references (scientific journals, reports...)	Advanced Petroleum Reservoir Simulation, 2010, M.R.Islam
Electronic References, Websites	MIT OpenCourseWave YouTube/reservoir simulation
Curriculum or Course Description Update Rate	9%

Head of department

Lecturer

Course Description Form

1. Course Name:
Petroleum Economics
2. Course Code:
PRE413
3. Semester / Year:
2nd Semester /2024-2025
4. Description Preparation Date:
3-9-2024
5. Available Attendance Forms:
In-person
6. Number of Credit Hours (Total) / Number of Units (Total)
30/2
7. Course administrator's name (mention all, if more than one name)
Mohammed Hasan Shaban Email: mohammedhasan@uomosul.edu.iq
8. Course Objectives

Course Objectives	1. - Provide students with a solid foundational knowledge of the oil and ene sector. 2. - Develop students' analytical and critical abilities in addressing petrole related issues. 3. - Enhance students' awareness of the strategic role of oil as a vital resource

9. Teaching and Learning Strategies	
Strategy	- Interactive theoretical lectures - Brainstorming and class discussions - Research reports and assignments - E-learning and digital resources - Case study analysis

10. Course Structure

Week	Hours	Required Learn Outcomes	Unit or subject na	Learning method	Evaluation metho
1	2	Understand the fundamentals of petroleum economics and its macroeconomic importance.	Introduction to Petroleum Economics and the Oil Industry	Lecture	Q&A & Discussion

2	2	Analyze supply and demand dynamics in the global oil market and price elasticity.	Global Oil Market Analysis: Supply & Demand	Lecture	Q&A & Discussion
3	2	Identify factors affecting oil prices and assess future trends.	Factors Influencing Oil Pricing	Lecture	Formative Assessn Exam
4	2	Comprehend the impact of oil reserves on market behavior and producer strategies.	Impact of Oil Reserves on the Global Market	Lecture	Q&A & Discussion
5	2	Track the evolution of oil sector investments and their economic impacts.	Investment Trends in the Oil Sector	Lecture	Q&A & Discussion
6	2	Recognize post-production activities such as refining, transportation, and distribution.	Post-production Operations and Gas Utilization	Lecture	Formative Assessn Exam
7	2	Understand economic theories related to non-renewable resource depletion.	Theories of Non-Renewable Resource Depletion	Lecture	Q&A & Discussion
8	2	Appreciate the importance of rational energy consumption for sustainable development.	Energy Economics and Consumption Rationalization	Lecture	Q&A & Discussion
9	2	Explore alternative energy sources and evaluate their economic and environmental feasibility.	Shift toward Alternative Energy Sources	Lecture	Q&A & Discussion
10	2	Analyze the relationship between energy use and environmental pollution; discuss emission reduction mechanisms.	Energy & Pollution: Challenges and Solutions	Lecture	Formative Assessn Exam
11	2	Understand energy policies in Iraq and dimensions of local and regional energy security.	Energy Policy and Security in the Iraqi Context	Lecture	Q&A & Discussion
12	2	Compare characteristics of depletable and renewable energy sources and substitution opportunities.	Substitution between Depletable and Renewable Sources	Lecture	Q&A & Discussion
13	2	Develop a future outlook on global energy sector transformations.	Future Foresight of the Global Energy Sector	Lecture	Formative Assessn Exam
14	2	Learn about electrical energy sources and their role in supporting development.	Concepts and Sources of Electrical Energy	Lecture	Q&A & Discussion
15	2	Comprehensive review and preparation for the final exam.	Comprehensive Review and Exam Preparation	Lecture	Q&A & Discussion

11. Course Evaluation

- Daily quizzes.
- Weekly examinations.

- Monthly tests. - Midterm examinations. - Final examination.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	.
Main references (sources)	Petroleum Industry Economics / Dr. Mahmoud Azhar Al-Sammak
Recommended books and references (scientific journals, reports…)	Energy Economics / Dr. Ahmad Jassim Al-Yasiri
Electronic References, Websites	

Head of department Lecturer

Course Description Form

1. Course Name:
Reservoir Management – Grade 4th
2. Course Code:
PRE421
3. Semester / Year:
2nd Semester / 2024−2025
4. Description Preparation
Date: 3/9/2024
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (60 Total) / Number of Units (3.5 Total)
7. Course administrator's name (mention all, if more than one name)
Name: Asst. Lecturer Sarah Saad Abdul-Jabbar Email: sarahsaad3860707@uomosul.edu.iq
8. Course Objectives

Course Objectives	● - Understand the principles of well testing. ● - Deal with reservoir evaluation techniques. ● - Understand the types of tests. ● - Determine the initial reservoir pressure measurement. ● - Determine the average reservoir pressure measurement. ● - Address formation damage due to drilling and completion. ● - Cover fluid flow equations. ● - Develop problem-solving skills using Darcy's Law. ● - Solve the diffusivity equation.

9. Teaching and Learning Strategies

Strategy	- Strategies to achieve a deep understanding of well testing principles, methodologies, and applications that enhance reservoir characterization and hydrocarbon recovery, adapting to evolving challenges and innovations in the petroleum industry

10. Course Structure

Theory

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	2	Introduction to Reservoir Management	Introduction to Reservoir Management	Discussion & Q&A	Group Discussion
Week 2		Introduction, Principles of Well Testing	Introduction, Principles of Well Testing		Evaluation Exam + Discussion
Week 3		Well Testing Objectives, Reservoir Evaluation	Well Testing Objectives, Reservoir Evaluation		Evaluation Exam
Week 4		Types of Tests	Types of Tests		Seminar
Week 5		Initial Reservoir Pressure Measurements	Initial Reservoir Pressure Measurements		Classroom Discussio
Week 6		Average Reservoir Pressure Measurements	Average Reservoir Pressure Measurements		Discussion Instant Exam
Week 7		Subsequent Measurements: Permeability (k), Reservoir Flow Capacity (kh), Drilling/Completion Damage (Skin), Drainage Area	Subsequent Measurements : Permeability (k), Reservoir Flow Capacity (kh), Drilling/Completion Damage (Skin), Drainage Area		
Week 8		Well Testing Procedures	Well Testing Procedures		Instant Exam or Discussion
Week 9		Key Points in Test Interpretation	Key Points in Test Interpretation		
Week 10		Pressure Transient Analysis	Pressure Transient Analysis		
Week 11		Pressure Build-up Test	Pressure Build-up Test		
Week 12		Drawdown Test	Drawdown Test		
Week 13		Injection Test	Injection Test		
Week 14		Principle of Superposition	Principle of		

			Superposition		
Week 15		Reservoir and Well Aspects	Reservoir and Well Aspects		General Questions and Final Exam
Practical					

Week	Hours	Unit or subjectname	Learning method	Evaluation method
Week 1	3	Formation Evaluation	Lectures + discussion	Report & Q&A
Week 2		Well Test Design		
Week 3		Pressure Build-up Test Analysis		
Week 4		Drawdown Test Analysis and Type Curve		
Week 5		Practical Project – Full Interpretation of Well Test Data		
Week 6				
Week 7				

11. Course Evaluation

- Semester Grade: 50% (35% theoretical including attendance, class discussions, short exams, and lab reports; 15% practical)
- Final Grade: 50% (40% theoretical; 10% practical)

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	"Well Testing" by John Lee (Essential reference covering principles applications of well testing.) Well Testing and Interpretation" by D. W. Matthews & W. R. Russell
Main references (sources)	* "Pressure Transient Testing" by D. M. Steward * "Modern Well Test Analysis" by Roland N. Horne
Recommended books and references (scientific journals, reports…)	* Journal of Petroleum Technology (JPT) * Society of Petroleum Engineers (SPE) papers * Journal of Canadian Petroleum Technology
Electronic References, Websites	* Society of Petroleum Engineers (SPE) website * OnePetro
Curriculum/ Syllabus Update Percentage	9%

Head of department

Lecturer

Course Description Form

1. Course Name: Reservoir Management – Grade 4th
2. Course Code: PRE421
3. Semester / Year: 2024/2025
4. Description Preparation Date: 3/9/2024
5. Available Attendance Forms: Attendance
6. Number of Credit Hours (60 Total) / Number of Units (3.5 Total)
7. Course administrator's name (mention all, if more than one name)
Name: Saad Waleed Saadi / Lecture Name: Maha Muneeb Al-Dabagh Email: saad.saadi@uomosul.edu.i Email: mahamuneeb@uomosul.edu.iq
8. Course Objectives

Course Objectives	• Understanding the basic principles of reservoir management: Students • are introduced to reservoir concepts, their natural formations, an • methods of exploration and evaluation. • Reservoir production management: Learning how to optimize reservoir productivity through techniques like water injection, ga injection, • and other enhanced oil recovery (EOR) methods. • Reservoir data analysis: Training students to analyze geological and engineering data, such as rock and fluid properties in the reservoir, • using mathematical models and simulation techniques. • Reservoir development planning: How to design strategies for • reservoir development and ensure maximum utilization of resources. • Environmental and economic challenges: Discussing the • environmental impact of reservoir management techniques and t economic feasibility of investing in these reservoirs. • Production strategy analysis: How to select the best strategies fo

	• oil and gas production based on geological and economic conditio • Modern technologies in reservoir management: Studying new • techniques such as digital modeling, artificial intelligence, and • advanced drilling technologies.

9. Teaching and Learning Strategies

Strategy	The learning strategy for the 'Reservoir Management' course relies on a set of methods that help students understand complex concepts and apply them in practical contexts through problem-based learning, collaborative learning, project-based learning, and the use of simulation techniques

10. Course Structure

Theory

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	2	Introduction to Reservoir Management	Reservoir Management	Theoretical	Group Discussion
Week 2		Types and Characteristic of Reservoirs			Evaluation Exam + Discussion
Week 3		Rock and Fluid Properti in Reservoirs			Evaluation Exam
Week 4		Reservoir Exploration Techniques			Seminar
Week 5		Reservoir Evaluation			Classroom Discussion
Week 6		Reservoir Modeling and Simulation			Discussion Instant Exam
Week 7		Drilling Techniques			
Week 8		Water and Gas Injection Enhanced Production			
Week 9		Enhanced Oil Recovery (EOR) Techniques			
Week 10		Production Management and Control			
Week 11		Environmental Challeng in Reservoir Managemer			Instant Exam or Discussion
Week 12		Economic Feasibility of Reservoir Management			
Week 13		Modern Technologies in Reservoir Management			
Week 14		Reservoir Management Amid Global Economic Challenges			
Week 15		Case Studies and Reserv Management Reports			General Questions and Final Exam

Practical

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	3	Introduction to Reservoi Modeling – Module 1	Reservoir Management	3	Practical Assessment
Week 2		Introduction to Reserv Modeling – Module 2			Electronic Report
Week 3		Reservoir Simulation Module 1			Report + Exam
Week 4		Reservoir Simulation Module 2			Report
Week 5		Reservoir Data Analysis			Discussion + Report
Week 6		Reservoir Rock and Fluid Characterization			Report
Week 7		Well Log Interpretation Part 1			Report + Discussion
Week 8		Well Log Interpretation Part 2			Evaluation Exam
Week 9		Enhanced Oil Recovery (EOR) Techniques			Exam
Week 10		Well Testing and Production Data Analysi			Online Activities
Week 11		Pressure Maintenance and Reservoir Management			
Week 12		Environmental Impact Assessment			
Week 13		Economic Feasibility Reservoir Development			Homework + Report
Week 14		Case Study Analysis Reservoir Management			Homework + Report
Week 15		Practical Test			Final exam

11. Course Evaluation

Grade distribution out of 100 based on student tasks such as daily preparation, daily exams, oral exams, monthly exams, written exams, reports, etc.

Semester Grade: 50%

- 35% Theory, which includes attendance, class discussions, short quizzes, and practical lab reports
- 15% Practical

Final Exam Grade: 50%

- 40% Theory
- 10% Practical

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Integrated Petroleum Reservoir Management, Abdus Sat 1990
Main references (sources)	Petroleum Reservoir Management, Ashok, K, Pathak, 2022

Recommended books and references (scientific journals, reports…)	Sciencedirect/ Reservoir Management
Electronic References, Websites	MIT OpenCourseWave
Curriculum/ Syllabus Update Percentage	9%

Head of department Lecturer