

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



Academic Program and Course Description Guide

2026

Academic Program Description Form

University Name: University of Mosul

Faculty/Institute: College of Petroleum and Mining Engineering

Scientific Department: Department of Petroleum Reservoir Engineering

Academic or Professional Program Name: Bachelor / Petroleum Reservoir Engineering

Final Certificate Name: Bachelor of Engineering in Petroleum Reservoir Engineering

Academic System: Bologna and Semester System

Description Preparation Date: 20 May 2026

File Completion Date: 20 June 2026

Signature: 

Head of Department Name:

Lect. Dr. Maha Muneeb Al-Dabagh

Date: 29/6/2026

Signature: 

Dean Scientific Associate Name:

Asst. Prof. Dr. Muneef Mahjoob Mohammed

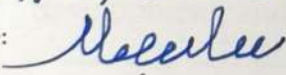
Date: 29/6/2026

The file is checked by:

Division of Quality Assurance and Performance Evaluation

Director of the Quality Assurance and Performance Evaluation Division: Sarah Jamal Halata

Date: 29/6/2026

Signature: 



Approval of the Dean

Ma'an H. Abdullah

29-6-2026

1. Program Vision

The leadership in petroleum reservoir engineering education and research, through preparing engineers specialized in oil and gas who possess modern knowledge and skills to efficiently utilize resources, achieve sustainability, support national development, and enhance competitiveness globally.

2. Program Mission

The Department of Petroleum Reservoir Engineering is committed to preparing distinguished engineers in oil and gas exploration and production through modern theoretical and practical curricula, integrating artificial intelligence and digital transformation technologies to enhance industry efficiency. The department also supports governmental and private sector institutions with scientific consultations and applied research, promoting sustainability and environmental protection.

3. Program Objectives

1. Provide modern academic programs in oil and gas engineering aligned with international standards and the needs of the labor market.
2. Enable students to use artificial intelligence and digital modeling techniques for efficient reservoir analysis and management.
3. Promote applied scientific research to address technical and environmental challenges in the oil and gas industry and support sustainability projects.
4. Build strategic partnerships with national and international oil companies to provide practical training and employment opportunities for graduates.
5. Offer technical and scientific consultations to governmental institutions and companies, contributing to efficient and environmentally responsible petroleum resource management.
6. Prepare research-oriented professionals capable of innovation, continuous development, and competing in both local and global markets.

4. Program Accreditation

The College of Petroleum and Mining Engineering, including the Petroleum Reservoir Engineering Department, is committed to achieving the nine standards outlined in the Iraqi Engineering Education Accreditation Council's guide

5. Other external influences				
Non				
6. Program Structure				
Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	4	9	59%	Essential
College Requirements	7	46	26%	
Department Requirements	45	120	69%	
Summer Training	Available			
Other				

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

7. Program Description					
Year/Level	Course Code	Course Name	Credit Hours		
			SSWL	USSWL	SWL
First Year (Bologna Process)	PRE111	General Geology I	79	96	175
	PRE112	Engineering Mechanics	63	112	175
	PRE113	Mathematics I	63	87	150
	PRE114	Workshop Technology	33	42	75
	PRE115	Physics	63	12	75
	UOM101	Arabic Language	33	17	50
	UOM104	Democracy and Human Rights	33	17	50
	PRE121	General Geology II	79	96	175
	PRE122	Chemistry	63	37	100
	PRE123	Mathematics II	63	87	150
	PRE124	Engineering Drawing and Descriptive Geometry	63	62	125
	PRE125	Engineering Practices	48	27	75
	UOM102	English Language I	33	17	50
	UOM103	Computer Science I	48	27	75
	PRE211	Structural Geology	63	37	100
	PRE212	Fundamentals of Petroleum Engineering	63	37	125
	PRE213	Petroleum Properties	63	37	100

Second Year (Bologna Process)	RRE214	Mathematics III	48	52	100
	PRE215	Thermodynamics	63	37	100
	PRE216	Fluid Mechanics	63	37	100
	UOM202	English Language II	33	17	50
	UOM203	Computer Science 2	48	27	75
	PRE221	Petroleum Geology	78	72	150
	PRE222	Strength of Materials	63	37	100
	PRE223	Mathematics IV	48	77	125
	PRE224	Petrophysical Rock Properties	78	97	175
	PRE225	Occupational Safety and Health	48	52	100
	UOM201	Arabic Language 2	33	17	50
	UOM205	Crimes of the Baath Regime in Iraq	33	17	50
Third Year (Bologna Process)	PRE311	Applied reservoir engineering 1	63	62	125
	PRE312	Drilling Fluid & Hydraulics	63	62	125
	PRE313	Production Engineering	48	52	100
	PRE314	Engineering Analytics	63	37	100
	PRE315	Geophysics	48	52	100
	PRE316	Well Logging and Formation Evaluation	63	62	125
	PRE317	Gas Technology	48	27	75
	PRE321	Applied reservoir engineering II	63	62	125
	PRE322	Rock Mechanics for Petroleum Engineers	48	52	100
	PRE323	Casing Design and Cementing	63	62	125
	PRE324	Petroleum Economics	48	52	100
	PRE325	Applied Mathematics and Geostatistics	63	62	125
	PRE326	Nodal Analysis	48	52	100
	PRE327	Artificial Intelligence	48	27	75
Fourth Year (Semester)	Course-Based System				
	Code	Course Name	Theoretical	Practical	
	PRE 411	Enhanced oil recovery I	---	3	
	PRE 412	Reservoir Characterization	3	2	
	PRE 419	Petroleum modelling	3	2	
	PRE 414	Advanced reservoir engineering	3	2	
	PRE 415	Core analysis	2	2	
	---	Graduation project	3	1	
	PRE 417	Enhanced oil recovery II	---	3	
	PRE 418	Reservoir simulation	2	2	

	PRE 413	Petroleum Economics	---	2
	PRE 420	Well testing	3	2
	PRE 421	Reservoir management	2	2

8. Expected learning outcomes of the program

Upon successful completion of the program, students will be able to:

Knowledge

- A-1** Explain the advanced mathematical and scientific concepts used to identify, formulate, and solve complex engineering problems in reservoir engineering for predicting field performance, fluid behavior, and geological relationships. (ABET: SO 1)
- A-2** Explain the principles and concepts of integrated engineering design for field development and reservoir management, including the economic, environmental, regulatory, and operational constraints associated with the petroleum industry. (ABET: SO 2)
- A-3** Explain mathematical models, the fundamentals of numerical simulation, and modern techniques used to analyze reservoir performance and predict reservoir behavior under different production condition

Skills

- B-1** Design integrated engineering plans for reservoir innovation, development, and management by applying modern technologies to improve production efficiency and enhance oil recovery. (ABET: SO 2)
- B-2** Function effectively as a member or leader of a multidisciplinary engineering team (drilling, production, and geology), planning tasks toward shared objectives to achieve the optimum development of oil fields. (ABET: SO 7)
- B-3** Conduct laboratory experiments (e.g., core and fluid analysis), and use reservoir modeling and simulation software, as well as artificial intelligence applications, to interpret data and draw engineering conclusions. (ABET: SO 3)
- B-4** Communicate effectively, both orally and in writing, in Arabic and English to prepare professional engineering reports and deliver technical presentations to diverse audiences. (ABET: SO 4).

Ethics

- C-1** Demonstrate commitment to engineering ethics and make informed engineering judgments that consider occupational safety, transparency, the mitigation of environmental impacts and harmful emissions, and the protection of national resources. (ABET: SO 5)
- C-2** Demonstrate self-directed learning and personal responsibility in acquiring new knowledge and emerging technologies, including digital transformation technologies, to keep pace with the rapid developments in the global petroleum industry after graduation. (ABET: SO 6)

9. Teaching and Learning Strategies	
• Computer laboratories • Graduation projects • Industrial training • Field visits to oil facilities	• Theoretical lectures • Discussion sessions • Laboratory experiments
10. Evaluation methods	
• Quizzes, midterm, and final exams • Reports	• Practical exams and homework assignments • Presentations

11. Faculty						
Faculty Members						
Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Lecturer	Geology	Paleontology and Stratigraphy			1	
Lecturer		Geophysics			2	
Lecturer		Sedimentology			2	
Lecturer		Petroleum Geology			1	
Lecturer		Geochemistry			1	
Lecturer	Chemistry	Artificial Chemistry			1	
Assistant lecturer	Mechanical Engineering	Thermal forces			2	
		Structure			1	

	Civil Engineering	Soil Mechanics			1	
	Statistics	Research and Operations			1	
	English	Translation			1	
	Agricultural	Agricultural Economics			1	

12. Professional Development

Mentoring new faculty members

- Teaching methods courses
- Continuing education courses
- Training courses
- Scientific seminars, workshops, and study sessions

Professional development of faculty members

A plan to develop the skills of the teaching staff in the Petroleum Reservoir Engineering Department by involving the largest possible number in local and international conferences, continuing education courses, scientific seminars, workshops, and study sessions held both inside and outside the university.

13. Acceptance Criterion

- 1- Iraqi nationality.
- 2- Holds an Iraqi preparatory school certificate endorsed by the General Directorate of Education in the governorate, or an equivalent certificate.
- 3- The student must be born in 2000 or later.
- 4- Must pass the medical examination according to the specific requirements of each program. Admitted students to colleges and institutes must undergo a (CBC) or (Hb-Electrophoresis) test at specialized medical centers. Blind students who meet the application requirements are allowed to apply through the central admission system for suitable humanitarian studies.
- 5- Must be fully dedicated to studying, and it is not permitted to combine employment with full-time study in morning colleges and institutes. This includes all employees of governmental institutions. To continue studying, employees must obtain a study leave from their departments according to the current regulations. It is also not permitted to pursue two academic programs simultaneously; if such a case is proven, the Ministry will be notified to cancel

the admission. If a student has two different admissions in the same year, they must choose one to cancel.

- 6- Must be a graduate of:
 - a. The current academic year.
 - b. The previous academic year, provided they were not accepted centrally into any college or institute. They can be admitted through the "previous year graduates" channel based on the minimum admission scores for their year of graduation, provided they did not enroll in private evening studies, public education, private morning education, or colleges affiliated with the endowments or institutes affiliated with other ministries.
- 7- Students returning from abroad in the tow academic year (2023/2024 and 2024/2025) are allowed to apply via the electronic portal of the Directorate of Studies, Planning, and Follow-Up using their designated electronic application form. The application will be considered valid once a temporary equivalency certificate is obtained from the Ministry of Education, Equivalency and Certificates Directorate. Graduates of the previous year must apply through the Central Admission Department, International Students Section.
- 8- Non-Iraqi students who hold an Iraqi preparatory certificate and are centrally admitted must be formally notified to report to the Central Admission Department / International Students Section to determine whether they are exempt from or required to pay tuition fees in foreign currency, according to the regulations stated in Chapter Seven of the Student Affairs Procedures Guide and Admission Rules and Conditions.
- 9-

14. The most important sources of information about the program

- Textbooks and reference materials available in: free education resources, department library, college library, and the central library
- Scientific resources available on the electronic space (online resources)

15. Program Development Plan

To develop the program, a comprehensive plan is established focusing on improving academic quality, enhancing collaboration with industry, and developing the necessary skills for students to face future challenges in the energy sector. The focus areas include:

1. Curriculum Update

- **Course Review:** Periodic assessment and review of the curriculum to ensure alignment with the latest advancements in petroleum reservoir engineering.
- **Introduction of New Courses:** Offering courses that cover new and innovative technologies, such as digital oil extraction and the use of artificial intelligence in reservoir analysis.

2. Industry Collaboration

- **Industrial Partnerships:** Developing partnerships with oil and gas companies and technology firms to provide training opportunities and collaborative research.
- **Joint Projects:** Encouraging students to participate in joint research projects with industry to apply their knowledge in real-world working environments.

3. Enhancing Infrastructure and Resources

- **Advanced Laboratories:** Upgrading laboratories and providing state-of-the-art equipment to enable realistic experiments and simulation of oil extraction processes.
- **Access to Data and Software:** Providing access to industry databases and modern engineering software to strengthen students' learning and research capabilities.

4. Student Skills Development

- **Workshops and Seminars:** Regular organization of workshops and seminars with industry experts to familiarize students with the latest challenges and innovations in the field.
- **Soft Skills Training:** Offering programs aimed at developing essential soft skills such as leadership, communication, and teamwork to prepare students for working in multidisciplinary teams.

5. Performance Evaluation and Monitoring

- **Continuous Evaluation System:** Developing a system for regular assessment of the program's performance, focusing on feedback from students and faculty members.

16. Program Skills Outline

Required program Learning outcomes

Course Code	Course Name	Basic or optional	Knowledge			Skills				Ethics	
			A1	A2	A3	B1	B2	B3	B4	C1	C2
PRE111	General Geology I	Basic		•							
PRE112	Engineering Mechanics	Basic	•								
PRE113	Mathematics I	Basic	•								
PRE114	Workshop Technology	Basic						•			
PRE115	Physics	Basic	•					•			
UOM101	Arabic Language	Basic							•		
UOM104	Democracy and Human Rights	Basic								•	
PRE121	General Geology II	Basic		•							
PRE122	Chemistry	Basic	•					•			

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Required program Learning outcomes

Course Code	Course Name	Basic or optional	Knowledge			Skills				Ethics	
			A1	A2	A3	B1	B2	B3	B4	C1	C2
PRE123	Mathematics II	Basic	•								
PRE124	Engineering Drawing and Descriptive Geometry	Basic	•					•			
PRE125	Engineering Practices	Basic	•	•				•			
UOM102	English Language I	Basic							•		
UOM103	Computer Science I	Basic			•			•			
PRE 211	Structural Geology	Basic		•							
PRE 212	Fundamentals of petroleum engineering	Basic	•	•							
PRE 213	Petroleum properties	Basic	•					•	•		
PRE 214	Mathematics III	Basic	•								
PRE 215	Thermodynamics	Basic	•								

16. Program Skills Outline

Required program Learning outcomes

Course Code	Course Name	Basic or optional	Knowledge			Skills				Ethics	
			A1	A2	A3	B1	B2	B3	B4	C1	C2
PRE 216	Fluid mechanics	Basic	•					•			
UOM 203	Computer II	Basic			•			•			
UOM 202	English language II	Basic							•		
PRE 221	Petroleum geology	Basic		•							
PRE 222	Strengths of materials	Basic	•								
PRE 223	Mathematics IV	Basic	•								
PRE 224	Petrophysical rock properties	Basic	•	•				•	•		
PRE 225	Occupational health and safety	Basic									•
UOM 201	Arabic Language II	Basic							•		

16. Program Skills Outline

Required program Learning outcomes

Course Code	Course Name	Basic or optional	Knowledge			Skills				Ethics	
			A1	A2	A3	B1	B2	B3	B4	C1	C2
UOM 205	Crimes of Baath regime in Iraq	Basic								•	
PRE311	Applied reservoir engineering 1	Basic	•	•		•					
PRE312	Drilling Fluid & Hydraulics	Basic	•					•			
PRE313	Production Engineering	Basic	•		•		•	•			
PRE314	Engineering Analytics	Basic	•								
PRE315	Geophysics	Basic	•	•				•			
PRE316	Well Logging and Formation Evaluation	Basic	•	•			•	•			•
PRE317	Gas Technology	Basic	•							•	
PRE321	Applied reservoir engineering II	Basic	•	•		•					

16. Program Skills Outline

Required program Learning outcomes

Course Code	Course Name	Basic or optional	Knowledge			Skills				Ethics	
			A1	A2	A3	B1	B2	B3	B4	C1	C2
PRE322	Rock Mechanics for Petroleum Engineers	Basic	•	•				•			
PRE323	Casing Design and Cementing	Basic	•				•			•	
PRE324	Petroleum Economics	Basic		•						•	
PRE325	Applied Mathematics and Geostatistics	Basic	•	•	•			•			
PRE326	Nodal Analysis	Basic	•	•			•	•			•
PRE327	Artificial Intelligence	Basic			•			•		•	
PRE 411	Enhanced oil recovery I	Basic	•	•			•				•
PRE 412	Reservoir Characterization	Basic	•	•				•	•		
PRE 419	Petroleum modelling	Basic			•			•			

16. Program Skills Outline

Required program Learning outcomes

Course Code	Course Name	Basic or optional	Knowledge			Skills				Ethics	
			A1	A2	A3	B1	B2	B3	B4	C1	C2
PRE 414	Advanced reservoir engineering	Basic	•	•							
PRE 415	Core analysis	Basic	•				•	•	•		
---	Graduation project	Basic	•	•	•	•	•	•	•	•	•
PRE 417	Enhanced oil recovery II	Basic	•			•				•	
PRE 418	Reservoir simulation	Basic			•			•			
PRE 413	Petroleum Economics	Basic		•						•	
PRE 420	Well testing	Basic	•					•	•		
PRE 421	Reservoir management	Basic		•	•	•	•			•	•

