

**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**

**2024-2025**

## **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.

## Academic Program Description Form

**University Name: University of Technology**

**Faculty/Institute: Oil and Gas Engineering**

**Scientific Department: Oil and Gas Engineering Department**

**Academic or Professional Program Name: B.Sc. in Petroleum Engineering**

**Final Certificate Name: B.Sc. in Petroleum Engineering**

**Academic System: Semesters**

**Description Preparation Date: 1/12/2024**

**File Completion Date: 5/12/2024**

**Signature:**

**Head of Department Name:**

**Date:**

**Signature:**

**Scientific Associate Name:**

**Date:**

**The file is checked by:**

**Department of Quality Assurance and University Performance**

**Director of the Quality Assurance and University Performance Department:**

**Date:**

**Signature:**

**Approval of the Dean**

## 1. Program Vision

To establish a leading educational and research institution in the field of oil and gas engineering that contributes to the sustainable development of the energy sector in Iraq and beyond.

## 2. Program Mission

To provide high-quality education, foster innovative research, and prepare competent engineers equipped with advanced skills and ethical values to address challenges in the oil and gas industry.

## 3. Program Objectives

The Oil and Gas Engineering Department at the University of Technology-Iraq has outlined the following program objectives:

- 1) **Preparing Skilled Engineers:** Equip students with the necessary expertise, scientific knowledge, and engineering qualifications to excel in various sectors of the oil and gas industry.
- 2) **Accredited Education:** Uphold and support the educational process in alignment with international accreditation standards to ensure high-quality learning outcomes.
- 3) **Promoting Sustainable Practices:** Integrate principles of sustainable design, renewable energy technologies, and environmental impact assessments into the curriculum, enabling students to develop solutions that minimize environmental footprints and optimize resource utilization.
- 4) **Community Engagement:** Forge partnerships with local communities and stakeholders to understand their needs, address concerns, and actively contribute to community development initiatives, including educational programs, infrastructure improvements, and capacity-building workshops.
- 5) **Research and Innovation:** Cultivate a culture that encourages research and innovation, aiming to explore and develop new technologies, methodologies, and best practices that enhance efficiency, safety, and sustainability within the oil and gas industry.
- 6) **Ethical Leadership:** Instill strong ethical values and professional integrity among students

and faculty, emphasizing responsible decision-making, transparency, and accountability in all facets of oil and gas engineering.

- 7) **Global Perspective:** Provide opportunities for international collaboration, exchange programs, and cross-cultural experiences to broaden students' perspectives and equip them with the skills and knowledge necessary to tackle diverse global challenges in the energy sector.
- 8) **Continuous Improvement:** Regularly assess and update the curriculum, facilities, and teaching methodologies to ensure they remain relevant, of high quality, and aligned with industry standards, emerging technologies, and evolving sustainability practices.
- 9) **Industry Partnerships:** Establish strategic partnerships with industry leaders, research institutions, government agencies, and non-profit organizations to facilitate knowledge exchange, internships, and collaborative projects that drive innovation and address real-world challenges in the oil and gas sector.
- 10) **Empowering Future Leaders:** Offer mentorship, professional development opportunities, and leadership training to empower students to become effective leaders, change agents, and advocates for sustainable development within and beyond the oil and gas industry.

These objectives reflect the department's commitment to producing well-rounded, competent, and socially responsible engineers capable of contributing positively to the oil and gas industry and society at large.

#### 4. Program Accreditation

Does the program have program accreditation? And from which agency?

No.

#### 5. Other external influences

Is there a sponsor for the program?

No.

#### 6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
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<b>Institution Requirements</b>	<b>13 (for All Stages)</b>	<b>612 (Sum of 13 courses)</b>	<b>19.03</b> (612/3216)	<b>Basic</b>
<b>College Requirements</b>	<b>17 (for All Stages)</b>	<b>945 (Sum of 17 courses)</b>	<b>29.38</b> (945/3216)	<b>Basic</b>
<b>Department Requirements</b>	<b>32 (for All Stages)</b>	<b>1749 (Sum of 32 courses)</b>	<b>54.38</b> (1749/3216)	<b>Basic</b>
<b>Summer Training</b>	<b>1 (1 month)</b>	<b>N. A.</b>	<b>N. A.</b>	<b>N. A.</b>
<b>Other</b>				

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

<b>7. Program Description</b>				
<b>Year/Level</b>	<b>Course Code</b>	<b>Course Name</b>	<b>Credit Hours</b>	
			<b>theoretical</b>	<b>practical</b>
First Year/ Semester I	ENLA111	English Language	48	
First Year/ Semester I	PRPE112	Principle to Petroleum Engineering	63	
First Year/ Semester I	CALC113	Calculus I	78	
First Year/ Semester I	EMSM114	Engineering Mechanics and Strength of Material	93	
First Year/ Semester I	COPR115	Computer Programming I	63	
First Year/ Semester I	WORK116	Workshops		90
First Year/ Semester I	GEGE117	General Geology I	63	
First Year/ Semester II	CHEM121	Chemistry	93	
First Year/ Semester II	GEGE122	General Geology II	63	
First Year/ Semester II	CALC123	Calculus II	78	
First Year/ Semester II	ENPR124	Engineering Practices	63	
First Year/ Semester II	ENET125	Engineering Ethics	48	
First Year/ Semester II	WORK116	Workshops		90
First Year/ Semester II	HURD126	Human Rights and Democracy	48	
Second Year/ Semester I	ORDE212	Ordinary Differential Equations	78	
Second Year/ Semester I	STGE215	Structural Geology	78	
Second Year/ Semester I	FLME213	Fluid Mechanic (I)	63	62
Second Year/ Semester I	PTCO222	Properties and Transportation of Crude Oil and Gas	78	47
Second Year/ Semester I	STOP216	Statistics and Optimization	78	
Second Year/ Semester I	PHTH225	Physics and Thermodynamic	93	
Second Year/ Semester I	COMP208	Computer	48	48

Second Year/ Semester I	CBRI201	Crimes of the Baath regime in Iraq	48	
Second Year/ Semester II	PADE226	Partial Differential Equations	78	
Second Year/ Semester II	PEGE221	Petroleum Geology	63	37
Second Year/ Semester II	FLME223	Fluid Mechanic (II)	93	
Second Year/ Semester II	PERE224	Petrophysics of Reservoir Engineering	78	39
Second Year/ Semester II	ENLA207	English Language (II)	33	33
Second Year/ Semester II	ARLAA204	Arabic Language	33	
Third Year / Semester I	PE341	Drilling Engineering I	60	
Third Year / Semester I	PE342	Well logging and formation evaluation I	45	
Third Year / Semester I	PE343	Drilling mud I	15	30
Third Year / Semester I	PE344	Production Engineering I	45	
Third Year / Semester I	PE321	Geophysics	45	
Third Year / Semester I	PE345	Reservoir Engineering I	45	30
Third Year / Semester I	PE331	Optimization	45	
Third Year / Semester I	PE322	Rock mechanics	30	
Third Year / Semester II	PE346	Drilling Engineering II	60	
Third Year / Semester II	PE347	Well logging and formation evaluation II	45	30
Third Year / Semester II	PE311	English Language III	15	30
Third Year / Semester II	PE332	Hazard, safety and Environment (HSE)	30	
Third Year / Semester II	PE348	Production Engineering I	45	
Third Year / Semester II	PE349	Gas and Oil Transportation	30	
Third Year / Semester II	PE350	Reservoir Engineering II	30	30
Third Year / Semester II	PE333	Numerical analysis	30	
Fourth Year / Semester I	PE441	Petroleum Reservoir Engineering	60	
Fourth Year / Semester I	PE442	Drilling Engineering	60	
Fourth Year / Semester I	PE443	Engineering Project	30	
Fourth Year / Semester I	PE444	Well Testing	45	
Fourth Year / Semester I	PE445	Integrated Field Development and Management I	45	
Fourth Year / Semester I	PE431	optimization	30	
Fourth Year / Semester I	PE446	Reservoir Simulation	60	
Fourth Year / Semester I	PE447	Risk analysis	30	

Fourth Year / Semester II	PE448	Directional drilling	60	30
Fourth Year / Semester II	PE449	Engineering project	30	
Fourth Year / Semester II	PE4410	Well monitoring and workover	45	
Fourth Year / Semester II	PE432	Engineering management	30	
Fourth Year / Semester II	PE4411	Integrated Field Development and Management II	45	
Fourth Year / Semester II	PE4412	Petroleum Economics	30	
Fourth Year / Semester II	PE4413	Natural Gas Engineering	60	
Fourth Year / Semester II	PE4414	Enhanced Oil Recovery	45	

## 8. Expected learning outcomes of the program

Knowledge	
<b>Learning Outcomes 1</b>	An ability to apply distinguish, identify, define, formulate, and solve engineering problems by applying principles of Petroleum engineering, science and mathematics
<b>Learning Outcomes 2</b>	An ability to create and carry out proper measurement and tests with quality assurance, analyze and interpret results, and utilize engineering judgment to make inferences.
Skills	
<b>Learning Outcomes 3</b>	An ability to produce engineering designs that meet desired needs within certain constraints by applying both analysis and synthesis in the design process.
<b>Learning Outcomes 4</b>	An ability to perceive the continual necessity for professional knowledge growth and how to find, assess, assemble and apply it properly.
<b>Learning Outcomes 5</b>	An ability to skillfully communicate orally with a gathering of people and in writing with various managerial levels
Ethics	
<b>Learning Outcomes 6</b>	An ability to perceive ethical and professional responsibilities in engineering cases and make brilliant judgments taking into account the consequences in worldwide financial, ecological and societal considerations
<b>Learning Outcomes 7</b>	An ability to work adequately on teams and to set up objectives, plan activities, meet due dates, and manage risk and uncertainty

## 9. Teaching and Learning Strategies

1. Lectures.
- 2- Discussion.
- 3- Presentations and listening.
- 4- Encourage students to team working.
- 5- Encouraging students to submit reports on problem and solutions related to the curriculum.



## 10. Evaluation methods

- Quizzes
- Assignments
- Midterm
- lab Exam
- lab Report
- project
- Evaluation
- Final Exam

## 11. Faculty

### Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)	Number of the teaching staff	
	General	Special		Staff	Lecturer
Prof. Dr.				1	
Prof. Dr.				2	
Prof. Dr.					1
Asst. Prof. Dr.				1	
Asst. Prof. Dr.				4	
Asst. Prof. Dr.					2
Asst. Prof.				1	
Lecturer				2	
Lecturer				6	
Asst. Lecturer				7	
Asst. Lecturer				7	
Asst. Lecturer					1

## Professional Development

### Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

### Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

## 12. Acceptance Criterion

**(Setting regulations related to enrollment in the college or institute, whether central admission or others)**

**Central admission**

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

For comprehensive information about the Oil and Gas Engineering program at the University of Technology–Iraq, the following resources are essential:

- 1) Department's Official Website: The Oil and Gas Engineering Department's homepage provides detailed insights into the department's vision, mission, objectives, academic programs, faculty profiles, and recent news.
- 2) Program Specification Document: The Program Specification outlines the curriculum structure, course descriptions, learning outcomes, and assessment methods, offering a clear understanding of the academic framework.
- 3) University's Main Website: The University of Technology–Iraq's official site offers broader information about university policies, admissions, campus facilities, and other departments, providing context to the Oil and Gas Engineering program within the university's ecosystem.
- 4) Departmental News and Events: Regular updates on departmental activities, conferences, seminars, and student achievements can be found on the department's news section, keeping stakeholders informed about ongoing developments.

These resources collectively offer a thorough overview of the Oil and Gas Engineering program, its academic offerings, and its role within the University of Technology–Iraq.

## 14. Program Development Plan

The Oil and Gas Engineering Department at the University of Technology–Iraq has developed a comprehensive program development plan to align with its mission of educating and empowering future engineers. The key components of this plan include:

- 1) **Curriculum Enhancement:** Regular updates to the curriculum ensure alignment with international accreditation standards and industry advancements. This includes integrating sustainable design principles, renewable energy technologies, and environmental impact assessments to prepare students for contemporary challenges.
- 2) **Faculty Development:** Investing in faculty through continuous professional development programs enhances teaching methodologies and research capabilities, fostering an environment of academic excellence.
- 3) **Research Initiatives:** Encouraging faculty and students to engage in innovative research addresses real–world challenges in the oil and gas sector, promoting a culture of inquiry and problem–solving.
- 4) **Industry Collaboration:** Establishing partnerships with leading industry organizations provides students with practical exposure through internships, workshops, and collaborative projects, bridging the gap between academia and industry.
- 5) **Community Engagement:** Participating in community development initiatives and addressing local needs fosters social responsibility among students and contributes to societal well–being.
- 6) **Infrastructure Development:** Upgrading laboratories, classrooms, and learning resources ensures students have access to state–of–the–art facilities, enhancing the learning experience.
- 7) **Quality Assurance:** Implementing robust quality assurance mechanisms maintains high educational standards and aligns with international best practices.

This strategic plan reflects the department's commitment to producing well–rounded, competent, and socially responsible engineers capable of contributing positively to the oil and gas industry and society at large.

## 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/ Semester I	ENLA111	English Language	Basic						o				o			
First Year/ Semester I	PRPE112	Principle to Petroleum Engineering	Basic	o	o									o		
First Year/ Semester I	CALC113	Calculus I	Basic	o				o								
First Year/ Semester I	EMSM114	Engineering Mechanics and Strength of Material	Basic	o				o						o		
First Year/ Semester I	COPR115	Computer Programming I	Basic	o	o											
First Year/ Semester I	WORK116	Workshops	Basic											o		
First Year/ Semester I	GEGE117	General Geology I	Basic					o				o	o			
First Year/ Semester II	CHEM121	Chemistry	Basic	o				o								
First Year/ Semester II	GEGE122	General Geology II	Basic	o				o								
First Year/ Semester II	CALC123	Calculus II	Basic	o				o								
First Year/ Semester II	ENPR124	Engineering Practices	Basic	o	o									o		

First Year/ Semester II	ENET125	Engineering Ethics	Basic										o			
First Year/ Semester II	WORK116	Workshops	Basic											o		
First Year/ Semester II	HURD126	Human Rights and Democracy	Basic						o					o		
Second Year/ Semester I	PE221	Ordinary Differential Equations	Basic	o				o								
Second Year/ Semester I	PE222	Structural Geology	Basic	o				o								
Second Year/ Semester I	PE231	Fluid Mechanic (I)	Basic	o												
Second Year/ Semester I	PE241	Crude oil properties	Basic	o									o			
Second Year/ Semester I	PE234	Statistics and Probability	Basic	o				o					o			
Second Year/ Semester I	PE232	Thermodynamic	Basic	o				o								
Second Year/ Semester I	PE223	Computer Programming (3D AutoCAD)	Basic	o				o								
Second Year/ Semester I	PE211	Human Rights	Basic						o					o		
Second Year/ Semester II	PE224	Partial Differential Equations	Basic	o				o								
Second Year/ Semester II	PE225	Petroleum Geology	Basic	o				o								
Second Year/ Semester II	PE233	Fluid Mechanic (II)	Basic	o				o								

Second Year/ Semester II	PE242	Reservoir Petrophysics	Basic	o				o		o			o		
Second Year/ Semester II	PE235	Strength of Material	Basic	o				o					o		
Second Year/ Semester II	PE212	English Language (II)	Basic						o			o			
Second Year/ Semester II	PE226	Computer Programming (Matlab)	Basic	o				o							
Second Year/ Semester II	PE213	Democracy	Basic						o				o		
Third Year / Semester I	PE341	Drilling I	Basic	o				o							
Third Year / Semester I	PE342	Well logging	Basic					o				o	o		
Third Year / Semester I	PE343	Drilling mud I	Basic							o					
Third Year / Semester I	PE344	Well completion and stimulation	Basic	o											
Third Year / Semester I	PE321	Geophysics	Basic	o				o	o				o		
Third Year / Semester I	PE345	Reservoir Fluid	Basic	o											
Third Year / Semester I	PE346	Gas Reservoirs	Basic	o	o			o	o						
Third Year / Semester I	PE347	Rock mechanics	Basic	o				o							
Third Year / Semester II	PE348	Drilling II	Basic	o	o										

Third Year / Semester II	PE349	Formation evaluation	Basic	o	o										
Third Year / Semester II	PE3410	Drilling mud II	Basic	o				o		o					
Third Year / Semester II	PE331	Hazard and Safety	Basic						o	o					
Third Year / Semester II	PE3411	Artificial Lift and well performance	Basic	o											
Third Year / Semester II	PE3412	Gas and Oil Transportation	Basic	o								o			
Third Year / Semester II	PE3413	Field Measurement and Surface Production	Basic	o	o										
Third Year / Semester II	PE332	Numerical Analysis	Basic	o	o										
Fourth Year / Semester I	PE441	Petroleum Reservoir Engineering	Basic	o											
Fourth Year / Semester I	PE442	Drilling Engineering	Basic		o								o		
Fourth Year / Semester I	PE443	Engineering Project	Basic	o	o								o		
Fourth Year / Semester I	PE444	Well Testing	Basic	o											
Fourth Year / Semester I	PE445	Integrated Field Development and Management I	Basic	o	o			o				o	o		
Fourth Year / Semester I	PE431	optimization	Basic	o				o		o					
Fourth Year / Semester I	PE446	Reservoir Simulation	Basic	o											

Fourth Year / Semester I	PE447	Risk analysis	Basic	o											
Fourth Year / Semester II	PE448	Directional drilling	Basic		o								o		
Fourth Year / Semester II	PE449	Engineering project	Basic	o	o								o		
Fourth Year / Semester II	PE4410	Well monitoring and workover	Basic	o											
Fourth Year / Semester II	PE432	Engineering management	Basic	o	o				o				o		
Fourth Year / Semester II	PE4411	Integrated Field Development and Management II	Basic	o	o			o				o	o		
Fourth Year / Semester II	PE4412	Petroleum Economics	Basic							o		o	o		
Fourth Year / Semester II	PE4413	Natural Gas Engineering	Basic	o											
Fourth Year / Semester II	PE4414	Enhanced Oil Recovery	Basic	o				o							

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



## Course Description Form

1. Course Name:					
2. Course Code:					
3. Semester / Year:					
4. Description Preparation Date:					
5. Available Attendance Forms:					
6. Number of Credit Hours (Total) / Number of Units (Total)					
7. Course administrator's name (mention all, if more than one name)					
Name:					
Email:					
8. Course Objectives					
<b>Course Objectives</b>			● ...		
9. Teaching and Learning Strategies					
<b>Strategy</b>					
10. Course Structure					
<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
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)					
Recommended books and references (scientific journals, reports...)					
Electronic References, Websites					