University of Baghdad
جامعة بغداد

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

بكالوريوس هندسة - هندسة النفط

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1. Mission & Vision Statement

Vision Statement

The department of petroleum engineering aims to achieve both national and international accreditation for its undergraduate petroleum engineering program as well as its postgraduate studies and research capabilities focused on solving drilling engineering problems, production engineering, reservoir engineering problems, enhancing oil recovery, formation evaluation, and well testing.

Mission Statement

The academic staff of Department of Petroleum Engineering at University of Baghdad aims to prepare students for the petroleum engineering sector through high-quality education, emphasizing theoretical knowledge, practical skills, and research capabilities. Our goal is to produce graduates who contribute effectively to the oil and gas industry. The curriculum and programs cover fundamental sciences, technical skills, and exposure to industry technologies. The program also focuses on personal and professional development, fostering critical thinking, communication, teamwork, and leadership. Our experienced faculty mentors guide students and provide opportunities for internships, projects, and research. Our curriculum meets international standards, and we collaborate with universities and industry partners for knowledge exchange and research advancement. Our extensive educational program prepares graduates to succeed in the oil and gas sector.

2. Program Specification

Programme code:	BSc-petroleum engineering	**ECTS**	240
Duration:	4 levels, 8 Semesters	**Method of Attendance:**	Full Time

Program Specification for Petroleum Engineering Department:

Program Overview: The Petroleum Engineering Department offers a comprehensive program that equips students with the knowledge and skills required for a successful career in the oil and gas industry. The program combines theoretical knowledge with practical applications to ensure graduates are well-prepared to tackle real-world challenges in the field.

Curriculum: The curriculum is designed to provide a strong foundation in core engineering principles and specialized knowledge in petroleum engineering. It includes courses in mathematics, physics, geology, reservoir engineering, drilling engineering, production engineering, well testing, petrophysics, and enhanced oil recovery.

Laboratories and Facilities: The Petroleum Engineering Department is equipped with state-of-the-art laboratories and facilities to enhance hands-on learning and research opportunities. These include geology and rock properties labs, drilling simulation labs, reservoir modeling labs, well testing labs, and production optimization labs.

Field Experience: The program emphasizes practical experience through field trips and internships. Students have opportunities to visit oil and gas fields, drilling sites, and production facilities to gain firsthand knowledge of industry practices. Internships with petroleum companies provide valuable exposure to real-world projects and challenges.

Research Opportunities: The department encourages research activities to advance the knowledge and technologies in the petroleum industry. Students have the opportunity to participate in research projects, collaborate with faculty members, and contribute to industry advancements through innovative research.

Industry Collaboration: The department maintains strong ties with the petroleum industry, collaborating with companies, professional organizations, and research institutions. Guest lectures, workshops, and industry partnerships provide students with insights into industry trends, networking opportunities, and potential career pathways.

Career Prospects: Upon graduation, students are prepared for diverse career opportunities in the petroleum industry. They can work in various roles such as reservoir engineer, drilling engineer, production engineer, petroleum consultant, or operations manager. Graduates may find employment in exploration and production companies, service providers, consulting firms, research organizations, and government agencies.

Professional Development: The program emphasizes the development of professional skills and attributes. Students are encouraged to participate in professional societies, attend conferences, and engage in continuous learning to stay updated with the latest industry developments and maintain professional certifications.

Ethical and Environmental Considerations: The curriculum addresses ethical issues related to the petroleum industry, including environmental stewardship, safety regulations, and sustainable practices. Students are encouraged to explore innovative approaches that balance industry demands with environmental responsibility.

Continuous Improvement: The department is committed to continuous improvement of the program, regularly reviewing the curriculum, seeking feedback from students and industry partners, and incorporating emerging technologies and industry trends to ensure graduates are equipped with the most relevant knowledge and skills.

3. Program Goals

The petroleum engineering department aims to achieve the following goals:
Education and Training: The department strives to provide a comprehensive and rigorous education to students pursuing petroleum engineering. It aims to equip them with the necessary knowledge and skills to excel in the field.
Research and Development: The department promotes cutting-edge research in petroleum engineering, focusing on innovative technologies, reservoir characterization, drilling techniques, production optimization, and environmental sustainability. It aims to contribute to the advancement of the industry through valuable research outcomes.
Industry Collaboration: The department seeks to establish strong ties with the petroleum industry, fostering collaboration and partnerships. It aims to facilitate knowledge transfer, internships, and industry-sponsored projects to ensure students' exposure to real-world challenges and opportunities.
Professional Development: The department aims to nurture students' professional growth by encouraging participation in professional societies, conferences, and workshops. It provides guidance and support for students to pursue certifications and licensure, fostering their career readiness.
Environmental Responsibility: Recognizing the importance of environmental stewardship, the department emphasizes sustainable practices in petroleum engineering. It aims to educate students about minimizing environmental impact, promoting energy efficiency, and exploring alternative energy sources.
Diversity and Inclusion: The department values diversity and aims to create an inclusive environment that welcomes individuals from diverse backgrounds. It promotes equal opportunities and encourages underrepresented groups to pursue petroleum engineering, fostering a diverse and vibrant community.

4. Student Learning Outcomes

Student Learning Outcomes (SLOs) for a petroleum engineering department typically focus on developing the knowledge, skills, and competencies necessary for success in the field of petroleum engineering. While the specific SLOs may vary among institutions, here are some common examples:

1-Technical Knowledge: Graduates should demonstrate a comprehensive understanding of the fundamental principles and concepts of petroleum engineering, including reservoir engineering, drilling and production operations, well design, fluid mechanics, and geology.

2-Problem-Solving Skills: Graduates should be able to apply critical thinking and problem-solving skills to analyze complex engineering problems in the petroleum industry. This includes the ability to design and optimize oil and gas extraction processes, evaluate reservoir performance, and make informed decisions regarding drilling and production operations.

3-Laboratory and Field Skills: Graduates should be proficient in conducting laboratory experiments and fieldwork related to petroleum engineering. This includes data collection, analysis, and

interpretation techniques, as well as hands-on experience with industry-standard equipment and technologies.

4-Teamwork and Communication: Graduates should be able to effectively collaborate with interdisciplinary teams and communicate technical information to diverse audiences. This includes written and oral communication skills, as well as the ability to work in multicultural and global settings.

5-Ethics and Sustainability: Graduates should have an understanding of ethical responsibilities and environmental considerations in petroleum engineering practice. This includes the ability to integrate sustainability principles into decision-making processes and promote responsible resource management.

6-Professional Development: Graduates should possess the necessary skills to adapt to evolving technologies, industry practices, and regulations in the field of petroleum engineering. This includes a commitment to lifelong learning, professional growth, and staying abreast of advancements in the industry.

These SLOs aim to ensure that petroleum engineering students acquire a strong foundation in technical knowledge, problem-solving abilities, teamwork, and professional conduct, enabling them to pursue successful careers in the petroleum industry while considering ethical and sustainable practices.

5. Academic Staff

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6. Credits, Grading and GPA

Credits

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

Grading

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

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Calculation of the Cumulative Grade Point Average (CGPA)

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

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

   CGPA = [(1st ^{m}odule score x ECTS) + (2nd ^{m}odule score x ECTS) + ……] / 240

7. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PENG116	General Geology	109	91	7.00	C	
PENG115	Engineering Mechanics	63	62	7.00	C	
CENG114	Mathematics I	63	87	6.00	B	
CENG113	Workshop Technology	33	42	4.00	S	
GE112	Computer Science I	63	37	4.00	S	
GE111	English Language I	63	37	2.00	S	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PENG126	Strength of Materials	63	62	5.00	C	
CENG125	Physics and Thermodynamics	93	82	7.00	C	
PENG124	Chemistry	63	62	5.00	C	
CENG123	Mathematics II	63	87	6.00	B	CENG114
CENG122	Engineering Drawing and Descrptive Geometry	63	62	5.00	B	
GE121	Democracy and Human Rights	33	17	2.00	S	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PENG216	Structural Geology	94	81	7.00	C	PENG116
PENG215	Fundamentals of Petroleum Engineering	63	62	5.00	C	
PENG214	Fluid Mechanics	63	37	4.00	C	PENG126
CENG213	Mathematics III	63	87	6.00	B	CENG123
GE212	Computer Science II	63	37	4.00	S	GE112
GE211	English Language II	63	37	4.00	S	GE111

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PENG226	Petroleum Geology	94	81	7.00	C	PENG216
PENG225	Petroleum Properties	63	62	5.00	C	
CENG224	Mathematics IV	63	87	6.00	B	CENG213
CENG223	Geostatistics	63	87	6.00	B	
CENG222	Electrical Technology	63	37	4.00	B	
GE221	Arabic Language	33	17	2.00	S	

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PENG316	Reservoir Engineering I and Rock Mechanics	94	81	7.00	C	PENG215
PENG315	Drilling Engineering I	94	81	7.00	C	PENG215
PENG314	Production Engineering I	63	37	4.00	C	PENG215
PENG313	Well Logging and Formation Evaluation	63	37	4.00	C	PENG215
CENG312	Engineering Analysis I	63	37	4.00	B	CENG224
PENG311	Gas Technology	63	37	4.00	C	PENG215

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PENG326	Reservoir Engineering II and FFTPM	94	81	7.00	C	PENG215
PENG325	Drilling Engineering II	94	81	7.00	C	PENG215
PENG324	Production Engineering II	63	37	4.00	C	PENG215
PENG323	Geophysics	63	37	4.00	C	PENG215
PENG322	Engineering Economics	63	37	4.00	B	CENG224
CENG321	Engineering Analysis II and PDE	63	37	4.00	C	PENG215

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PENG416	Reservoir Characterization	63	87	6.00	C	PENG 316, PENG326
PENG415	Drilling Engineering III	63	87	6.00	C	PENG315, PENG 325
PENG414	Integrated Reservoir Management	63	37	4.00	C	PENG 316, PENG326
PENG413	Well Test and Stimulation	63	37	4.00	C	PENG215
PENG412	Numerical Methods and Reservoir Simulation	94	56	6.00	C	PENG 316, PENG326, CENG321
CENG411	Engineering Project I	63	37	4.00	C	

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PENG426	Applied Reservoir Engineering	78	72	6.00	C	PENG 316, PENG326
PENG425	Secondary and Enhanced Oil Recovery	78	47	5.00	C	PENG 316, PENG326
PENG424	Production Optimization	63	62	5.00	C	PENG314, PENG324, PENG311
PENG423	Directional Drilling and Drilling Optimization	63	87	6.00	C	PENG415
PENG422	Optimization	63	37	4.00	B	
CENG421	Engineering Project II	63	37	4.00	C	CENG411

8. Contact

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