Faculty of Engineering Council Meeting

Greetings and respect,

Attached herewith, we send you a copy of the minutes of Regular Meeting No. (8) of our Faculty Council for the academic year (2024–2025) held on (4/3/2025). Please kindly review and inform us upon approval.

With respect…

Asst. Prof. Dr. Jamal Ismail Kak Rasul

Acting Dean of the Faculty

Minutes of Meeting No. (8) of the Faculty of Engineering Council Held on (4/3/2025)

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With respect,

Asst. Prof. Dr. Jamal Ismail Kak Rasul

Acting Dean of the Faculty

- **Agenda Item 1: Approval of Previous Minutes**

  The council reviewed previous decisions to confirm implementation and officially confirmed the minutes following approval by the University President.

- **Agenda Item 2: Scientific Affairs**

- Section 1 (University Council Directives): The council resolved to enforce University Council directives, including using SIS for exam calculations, continuing KAEE accreditation efforts, setting Student Conference dates for April 29–30, 2025, and scheduling graduation photos for April 15–17, 2025.
- Section 2 (Department Name Change Proposal): Reviewed the proposal from the Petroleum and Mining Engineering Department to change its name to Department of Petroleum and Geo-Energy Engineering. The council recommended submitting the proposal to the University Council for formal discussion and approval.

Proposal for Renaming the Petroleum Engineering Department to Petroleum and Geo-Energy Engineering Department

Prepared by: Department of Petroleum and Mining Engineering, Faculty of Engineering, Soran University

Date: March 2025

Executive Summary

The global energy industry is undergoing a significant transformation, with a shift towards cleaner, more sustainable energy sources. While oil and natural gas remain essential to global energy needs, there is a growing demand for technologies that reduce carbon footprints, such as geothermal energy, subsurface energy storage, and carbon capture and storage (CCS).

Based on the Soran University mission, graduates need to be trained for the labor market through identifying and developing talents, and this requires programs to stay aligned with global and regional development needs. Therefore, the Department of Petroleum and Mining Engineering at Soran University proposes renaming the department to the Department of Petroleum and Geo-Energy Engineering, as part of Soran University's movement toward serving the nation.

This change reflects a broader educational and research scope that includes both traditional oil and gas production and emerging geo-energy technologies, preparing

our students for future career opportunities in both traditional and green energy sectors.

Section 1: Rationale for the Name Change

1. Alignment with Global Energy Transitions: The world is shifting toward low-carbon and renewable energy sources. Key international organizations (such as the IEA and IPCC) highlight the importance of underground energy solutions, including geothermal systems, carbon storage, and hydrogen storage.
2. Expanding Career Opportunities for Students: Traditional petroleum jobs are evolving. Energy companies are investing in low-carbon energy projects. Equipping students with knowledge in Geo-Energy opens up career pathways in renewable energy, subsurface storage, environmental consulting, and technology sectors.
3. Addressing Regional Energy Needs: Kurdistan and Iraq possess significant potential for geothermal energy and subsurface energy storage. Updating the department's scope helps address local energy demands while maintaining strong ties to the region's vital oil and gas sector.
4. Modernizing the Curriculum with AI and Digitalization: Geo-Energy and Petroleum Engineering now heavily rely on data science, machine learning, and artificial intelligence. The updated curriculum introduces modern digital tools, data mining, and smart engineering concepts.

Section 2: Practical Applications of New Modules

The new modules have direct applications in real-world energy projects. Below are some practical examples:

- Unconventional Reservoirs: The Permian Basin (USA) and Montney Formation (Canada) are examples of tight reservoirs that require advanced hydraulic fracturing techniques.
- Subsurface Energy Storage: Natural gas is stored in depleted reservoirs in Europe and North America for seasonal energy supply. Hydrogen storage in salt caverns is also being developed in Germany and the USA.

- Sustainable Energy Extraction: The Hellisheidi Geothermal Power Plant in Iceland is a successful example of geothermal energy providing both electricity and heating.
- Carbon Capture and Storage (CCS): The Sleipner Project in Norway has been storing CO_2 in a subsurface reservoir since 1996, reducing emissions into the atmosphere.

These examples demonstrate how our updated curriculum prepares students to work in cutting-edge energy projects worldwide.

Section 3: Impact on Students and Career Opportunities

This transition offers many benefits for students, including:

- More career options: Graduates can work in both traditional petroleum roles and emerging energy fields.
- Sustainability-focused careers: Students can now specialize in geothermal energy, CO_2 storage, and hydrogen storage.
- AI and data-driven careers: With the rise of AI in energy, graduates can work in machine learning, reservoir simulations, and smart drilling operations.
- Research and academic opportunities: The new subjects provide a foundation for students who want to continue with postgraduate studies in sustainable energy.

Section 4: Departmental Vision

The Department of Petroleum and Geo-Energy Engineering will be one of the distinguished Petroleum and Geo-Energy departments in the region, renowned for the excellence, impact, and distinctiveness of both its research and teaching. The department will become the engineering choice in Kurdistan and the region for students seeking a quality academic program with individualized attention in a high learning environment. The Department of Petroleum and Geo-Energy Engineering challenges its students and employees to think critically and independently, develop lifelong learning habits, acquire career skills, and become productive Geo-Energy and petroleum engineers in the regional and global community.

Section 5: Departmental Mission

The Department of Petroleum and Geo-Energy Engineering at Soran University's mission is to provide high-quality education, research, and professional training in the fields of petroleum and Geo-Energy engineering.

Students graduating from the Petroleum and Geo-Energy engineering program shall be well-prepared to serve the oil, gas, and Geo-Energy industry through their technical knowledge, which makes the graduates capable of following different branches of Petroleum and Geo-Energy Engineering—from prospecting, reservoir development, drilling, reservoir, production, and Geo-Energy production—necessary to address the challenges and contribute to the sustainable development of the petroleum and Geo-Energy industries.

The department strives to deliver a comprehensive and rigorous curriculum that encompasses the fundamental principles, theories, and practices of petroleum and sustainable engineering. Through a combination of theoretical instruction, laboratory work, and field experiences, students are prepared to become competent engineers capable of solving complex problems in the industry.

The department is committed to conducting cutting-edge research in various areas of petroleum and geo-energy engineering. The faculty and students engage in innovative research projects that address current industry challenges, explore new technologies, and seek sustainable solutions.

The department emphasizes the development of practical skills and professional competencies among its students. Through industry collaborations, internships, and cooperative programs, students gain hands-on experience and exposure to real-world scenarios.

Section 6: Program Vision Statement -

- Petroleum Engineering Vision: The vision of the Petroleum Engineering program is to play a leadership role in providing human capabilities and new understandings in the country by providing world-class education and research for the oil and gas industry.
- Geo-Energy Engineering Vision: The Geo-Energy Engineering program is dedicated to providing a comprehensive education that prepares students to excel as professionals in the Geo-Energy industry. Our program combines academic coursework with

practical training and hands-on experiences to equip students with the knowledge, skills, and values necessary for success.

These two programs are designed to prepare graduates for Geo-Energy, resources, petroleum, and related industries both in Kurdistan and abroad, as well as facilitate graduates carrying on to higher education.

Section 7: Program Mission Statement -

- Petroleum Engineering Mission: The mission of the Petroleum Engineering program is to prepare students for the practice of their profession in drilling, reservoir exploration, and production engineering for underground hydrocarbon resources, and for the improvement of understanding and technology that form the principle of petroleum engineering, along with discovering solutions to the national, international, and environmental concerns associated with the oil and gas industry.
- Geo-Energy Engineering Mission: The mission of our Geo-Energy Engineering program is to provide a transformative education that prepares students to become skilled Geo-Energy professionals, leaders, and innovators. Our program is dedicated to fostering academic excellence, promoting industry relevance, and instilling a commitment to ethical and sustainable practices.

Section 8: Department Overview -

The Petroleum and Geo-Energy Engineering program is designed to cater to the growing demand for education in emerging energy sectors, including oil and gas, geothermal, hydrogen, renewable energy, energy storage, and CO_2 capture and sequestration. In response to the ongoing global energy transition, the degree is strategically crafted to address the evolving landscape of the energy industry and equip graduates with the skills needed for emerging energy initiatives.

The coursework is tailored to meet the shifting demands of the global energy sector, making this degree a forward-looking platform for the 21st century. It prepares students for diverse careers in both traditional and renewable subsurface energy.

The curriculum focuses on key areas such as subsurface energy storage, geothermal engineering, subsurface engineering geological characterization, carbon capture,

sequestration, and storage, as well as the production of hydrogen from natural gas. These targeted areas of study ensure that students acquire specialized knowledge and skills relevant to the current and future needs of the energy industry, positioning them for a wide range of career opportunities.

Section 9: Program Educational Objectives -

1. The capacity to recognize, analyze, and solve complex engineering challenges using engineering, scientific, and mathematical principles with a focus on petroleum and geo-energy engineering issues.
2. Competence in applying engineering principles and practices for the safe, efficient, and sustainable exploration, development, production, transportation, and management of petroleum and renewable geo-energy resources.
3. Ability to use engineering design to create and implement solutions for the petroleum and geo-energy sectors, considering specific industry demands while taking into account public health, safety, and welfare, as well as global, cultural, social, environmental, and economic concerns.
4. Ability to design and perform relevant experiments, analyze and interpret data, and draw conclusions using sound engineering judgment.
5. Preparedness for geo-energy and petroleum careers in industry by integrating scientific and engineering knowledge in practical environments and effectively managing technical solutions to industry challenges.
6. Ability to use suitable learning methodologies to acquire and apply new information as needed in a dynamic and evolving industry landscape.

Section 10: Program Learning Outcomes -

1. Graduates will demonstrate an ability to apply the principles of engineering, science, and mathematics to identify, formulate, and solve Geo-Energy and Petroleum Engineering problems.

2. Graduates will be able to apply designs to produce solutions that meet specified Petroleum and Geo-Energy project needs with consideration of health, safety, and environment.
3. Graduates will be able to design and perform relevant experiments, analyze and interpret data of Petroleum and Geo-Energy experimentation correctly, interpret data, and draw conclusions using engineering judgment.
4. Make a logical and reasonable engineering evaluation of the data to develop a solution for specific Petroleum and Geo-Energy projects.
5. Graduates will demonstrate the ability to function as a member of engineering and science laboratory teams, as well as on multidisciplinary design teams.
6. Graduates will demonstrate the ability to learn and work independently to identify and solve Geo-Energy and petroleum engineering-related problems.

Section 11: Module Overview & Curriculum Adjustments

Agenda & Deliberations

- **Agenda Item 1: Approval of Previous Minutes**

  The council reviewed previous decisions to confirm implementation and officially confirmed the minutes following approval by the University President.

- **Agenda Item 2: Scientific Affairs**

  - Section 1 (University Council Directives): The council resolved to enforce University Council directives, including using SIS for exam calculations, continuing KAEE accreditation efforts, setting Student Conference dates for April 29–30, 2025, and scheduling graduation photos for April 15–17, 2025.
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Catalogue & Curriculum Proposal

1. Introduction

The global energy landscape is transitioning toward sustainable energy, though fossil fuels still account for ~80% of global consumption. The department is updating its focus to Petroleum and Geo-Energy Engineering to combine traditional petroleum concepts with geothermal energy, subsurface storage, carbon management, and AI/digital transformation.

Module Changes

Category	Modules
Unchanged Modules	Freshman: General English, Kurdology, Calculus, Engineering hemistry, General Physics, Academic Debate, Information Technology, Critical Reading & Writing Sophomore: Thermodynamics, Engineering Ethics, General and tructural Geology, Petroleum Geology, Fluid Mechanics, Engineering tatics & Strength of Materials, Geophysics, Engineering Mathematics Junior: Production Surface Facilities, Reservoir Fluid Properties, Reservoir Rock Properties, Fundamental of Reservoir Eng., Reservoir Engineering, Production Engineering, Well Testing enior: Reservoir Simulation, Introduction to Drilling Systems, Drilling luids and Cementing, HSE, Enhanced Oil Recovery, Capstone Project,

Category	Modules
	Well Completion & Intervention, Petroleum Refinery, Research Methodology
Modified Modules	• Intro. to Petroleum Engineering → *Intro. to Petroleum and Geo-Energy Engineering* Formation Evaluation with Well-logs → *Well Logging (Digital Focus)* • Petroleum Geomechanics → *Fundamentals of Petroleum and Geo-Energy Geomechanics* • Petroleum Economics → *Petroleum and Geo-Energy Economics* Numerical Methods → *Numerical Computation Methods (Integrates AI/Digital Tools)*
Newly Added Modules	troduction to Geothermal Energy, Renewable Energy, Introduction to Underground Storage, Unconventional Reservoir Engineering, Well Control Fundamentals, Research Methodology, Data Mining in Petroleum Engineering, Artificial Intelligence and Digital Transformation, Natural Gas Engineering

Graduation & Credit Requirements (Bologna Process)

- **Total Credits Required: 240 ECTS**
- **Minimum Cumulative GPA: 2.00 / 4.00 (or 50.00 / 100)**

equirement Level	Modules & ECTS
National Requirements	Kurdology (6 ECTS), General English (6 ECTS)
University Requirements	nformation Technology (6 ECTS), Academic Debate (6 ECTS), Critical Reading and Writing (6 ECTS), Engineering Ethics (3 ECTS)
Faculty Requirements	alculus (6 ECTS), Engineering Chemistry (6 ECTS), Intro. to Petroleum Geo-energy Engineering (3 ECTS), Statics and Strength of Materials 6 ECTS), Engineering Mathematics (6 ECTS), General and Structural Geology (6 ECTS), Partial Differential Equations (6 ECTS), Fluid Mechanics (6 ECTS), Numerical Computation Methods (6 ECTS), Thermodynamics (6 ECTS), General Physics (6 ECTS)
Core Modules	eservoir Fluid Properties (6), Petroleum Geology (6), Intro. to Drilling Systems (6), Drilling Fluid and Cementing (6), Well Control Fundamentals (6), Well Completion and Intervention (6), Reservoir Rocks Properties (6), Geophysics (6), Fundamental of Reservoir Eng. (6), Reservoir Engineering (6), Fundamentals of Petroleum & Geo-Energy Geomechanics (6), Petroleum Production Surface acilities (6), Petroleum Refinery (6), Production Engineering (6), Well Testing (6), Fundamental of Well Logging (6), HSE (6), Research Methodology (6), Capstone Project (6), Petroleum and Geo-energy Economics (6), Reservoir Simulation (6), Enhanced Oil Recovery (6), Intro. to Geothermal Energy (6), AI and Digital Transformation (6),

equirement Level	Modules & ECTS
	Intro. to Underground Storage (6), Data Mining in Petroleum Engineering (6)
lective Modules	Properties of Petroleum Products (6), Petrophysics (6), Reservoir anagement (6), Energy Storage Systems (6), Natural Gas Engineering (6), Ground Control and Support (6), Sustainable Practices in Petroleum Eng. (6), Field Development and Management (6), Geostatistics (6)

Grading System & GPA Scale

Grade	Percentage Range	Numerical Equivalent
A	**90–100**	**5.0**
B	**80–89**	**4.0**
C	**70–79**	**3.0**
D	**60–69**	**2.0**
E	**50–59**	**1.0**
F	**< 50**	**0.0**

Program Curriculum Structure (Typical 8-Semester Plan)

Semester 1

Code	Course Title	Th	T/L	ECTS	Type	Pre-req
PSOU20001	Calculus	3	1	6	S	—
PSOU20002	Introduction to Petroleum and Geoenergy Engineering	2	0	3	C	—
PSOU20003	Engineering Ethics	2	0	3	B	—
PSOU20004	General English	1	3	6	B	—
PSOU20005	Information Technology	2	3	6	B	—
PSOU20006	Kurdology	3	0	6	B	—

Semester 2

Code	Course Title	Th	T/L	ECTS	Type	Pre-req
PSOU20007	Engineering Chemistry	2	3	6	S	—
PSOU20008	General Physics	2	3	6	S	—
PSOU20009	Engineering Mathematics	3	1	6	S	PSOU20001
PSOU20010	Academic Debate	1	3	6	B	—
PSOU20011	Critical Reading and Writing	3	0	6	B	—

Semester 3

Code	Course Title	Th	T/L	ECTS	Type	Pre-req
PSOU20012	Thermodynamics	3	1	6	S	—
PSOU20013	General and Structural Geology	2	3	6	C	—
PSOU20014	Reservoir Fluid Properties	2	3	6	C	—
PSOU20015	Partial Differential Equations	3	1	6	S	—
PSOU20016	Engineering Statics and Strength of Materials	3	1	6	S	—

Semester 4

Code	Course Title	Th	T/L	ECTS	Type	Pre-req
PSOU20017	Fluid Mechanics	3	1	6	S	—
PSOU20018	Petroleum Geology	2	3	6	C	PSOU20013
PSOU20019	Numerical Computation Methods	3	1	6	S	—
PSOU20020	Reservoir Rock Properties	2	3	6	C	—
PSOU20021	Geophysics	3	1	6	S	—

Semester 5

Code	Course Title	Th	T/L	ECTS	ype	Pre-req
PSOU20022	Introduction to Drilling Systems	3	1	6	C	—
PSOU20023	Fundamental of Reservoir Engineering	3	1	6	C	PSOU20014
PSOU20024	Introduction to Geothermal Energy	3	1	6	E	—
PSOU20025	Well Logging	2	3	6	C	PSOU20020
PSOU20026	Fundamental of Petroleum and Geo-Energy Geomechanics	3	1	6	C	—
PSOU20027	Renewable Energy	3	1	6	E	—

Semester 6

Code	Course Title	Th	T/L	ECTS	ype	Pre-req
PSOU20028	Reservoir Engineering	3	1	6	C	PSOU20023
PSOU20029	Introduction to Underground Storage	3	1	6	E	PSOU20026
PSOU20030	ealth, Safety, and Environment (HSE)	3	1	6	B	—
PSOU20031	Petroleum Production Surface Facilities	3	1	6	C	—

Code	Course Title	Th	T/L	ECTS	Type	Pre-req
PSOU20032	Drilling Fluids and Cementing	2	3	6	C	PSOU20022
PSOU20033	Unconventional Reservoir Engineering	3	1	6	E	—

Semester 7

Code	Course Title	Th	T/L	ECTS	Type	Pre-req
PSOU20034	Well Testing	3	1	6	C	—
PSOU20035	Well Control Fundamentals	3	1	6	C	—
PSOU20036	Research Methodology	2	1	6	C	—
PSOU20037	Petroleum and Geo-Energy Economics	2	3	6	C	—
PSOU20038	Production Engineering	3	1	6	C	—
PSOU20039	Petroleum Refinery	3	1	6	E	—
PSOU20040	Natural Gas Engineering	3	1	6	E	—

Semester 8

Code	Course Title	Th	T/L	ECTS	Type	Pre-req
PSOU20041	Reservoir Simulation	2	3	6	C	—

Code	Course Title	Th	T/L	ECTS	ype	e-req
PSOU20042	Enhanced Oil Recovery	3	1	6	C	—
PSOU20043	Well Completion & Intervention	3	1	6	C	—
PSOU20044	Capstone Project	2	3	6	C	—
PSOU20045	ata Mining in Petroleum Engineering	3	1	6	E	—
PSOU20046	Artificial Intelligence and Digital Transformation	3	1	6	E	—

Academic Staff

Name	egree / Title	Role	Email
Hewa Hussein Omar	PhD	Head of Department	hewa.omar@soran.edu.iq
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Fwad Hatam Yousefi	M.Sc	Coordinator	foad.yousefi@soran.edu.iq

Name	Degree / Title	Role	Email
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- **Program Manager: Ph.D. Mechanical Engineering — hewa.omar@soran.edu.iq**
- **Program Coordinator: M.Sc. Petroleum Engineering — foad.yousefi@soran.edu.iq**

Conclusion:

The transition from Petroleum Engineering to Petroleum and Geo-Energy Engineering is a necessary step to align with global energy trends. By integrating geo-energy, AI, and sustainable resource management, this change ensures that our graduates are ready for the future energy industry. This transformation strengthens our department's reputation, provides students with better job opportunities, and ensures that our curriculum remains relevant.

Council Members & Signatories

1. **Asst. Prof. Dr. Jamal Ismail Kak Rasul**

Role: **Acting Dean of Faculty & Council President**

Status: **[Signed]**

2. **Asst. Prof. Bahaalddin Feqi Ahmed Aziz**

Role: **Vice Dean for Administrative and Student Affairs**

Status: **[Signed]**

3. **Asst. Prof. Dr. Badi' Abdullah Mahmud**

Role: **Head of Chemical Engineering Department**

Status: **[Signed]**

4. **Dr. Hewa Hussein Omar**

Role: **Head of Petroleum and Mining Engineering Department**

Status: **[Signed]**

5. **Dr. Jiya Yusuf Rahimzadeh**

Role: **Head of Civil and Environmental Engineering Department**

Status: **[Signed]**

6. **Dr. Nizar Shaker Piro**

Role: **Head of Mechatronics and Robotics Engineering Department**

Status: **[Signed]**

Subject: Request for Approval of Department Name Change

Greetings,

We submit to you the decision of the Soran University Council in its Meeting No. 15 regarding the structural update and renaming of the Department of Petroleum and Mining Engineering to the Department of Petroleum and Geo-Energy Engineering. Attached are the proposal details, curriculum modifications, and meeting minutes. We kindly request your formal approval to enact this change.

Respectfully,

Asst. Prof. Dr. Sherwan Sharif Qurtas

President of Soran University

- From: Directorate of Quality Assurance and Accreditation, Ministry of Higher Education & Scientific Research
- Decision: Approval is hereby granted to Soran University to rename the Department of Petroleum and Mining Engineering to the Department of Petroleum and Geo-Energy Engineering starting from the academic year (2026–2027).

2. Soran University Administrative Order (Decree)

- Ref No.: 1392/1/1
- Date: 2/6/2026

Pursuant to Ministry Approval Letter No. 8836 dated 1/6/2026, it is hereby decreed:

1. The Department of Petroleum and Mining Engineering in the Faculty of Engineering is officially renamed to the Department of Petroleum and Geo-Energy Engineering.
2. This decree shall take effect beginning with the 2026–2027 academic year.
3. All administrative and academic units shall update their records accordingly.

Asst. Prof. Dr. Sherwan Sharif Qurtas

President of Soran University