



Program Catalogue | 2025-2026 | دليل البرنامج الدراسي

جامعة العين العراقية
ALAYEN IRAQI UNIVERSITY
الكلية التقنية الهندسية
College of Technical Engineering



Bachelor's degree (B.Sc.) – Fuel and Energy Engineering Techniques

بكالوريوس علوم – تقنيات هندسة الوقود والطاقة



ALAYEN UNIVERSITY
قسم الاعلام والعلاقات العامة



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1. Mission & Vision Statement

Vision Statement

Qualifying distinguished and innovative competencies scientifically and with high skill and professional and ethical behavior who are able to keep pace with developments in the fields of Fuel and Energy Engineering Techniques and facing the engineering scientific challenges to provide applicable solutions and community service.

Mission Statement

Graduating distinguished technical engineers with qualified scientific and ethical levels and high efficiency in the fields of Fuel and Energy Engineering Techniques by providing an advanced scientific environment and specialized faculty to be able to complete the process of higher education and professional learning and provide community service within multidisciplinary work times.

2. Program Specification

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

Fuel and Energy Technologies Engineering prepares students for careers in the fuel and energy industries by providing them with skills to improve themselves. Thus, the student will have extensive knowledge of refinery processing, petrochemicals, crude oil, and natural gas processing. Fuel and energy courses are integrated into the curriculum. Developing and testing solutions to improve industrial equipment to maximize petroleum refining Students will have the opportunity to learn the



principles of chemical engineering, energy engineering, and related materials, and they will be prepared to keep pace with the development of modern methods required in the labor market and companies dealing with the design, implementation, and operation of plants and refineries. In addition, students will be equipped with knowledge of modern design techniques or optimization of technical calculations for renewable energy in industrial settings

Level 1 exposes students to the fundamental principles of chemical engineering and chemistry, which are suitable for progression to all programs within the department. Course-specific core topics are covered at Level 2 and prepare for research-oriented subject modules at Levels 3 and 4. **FEE** graduates are therefore trained to understand how research influences teaching, according to the university's and department's mission statements. In levels 2, 3 and 4 **FEE** students cover mass balance and energy balance after taking basic principles and covers knowledge of chemistry topics. Students acquire skills in oil refining. Ultimately, FEE graduates will acquire knowledge and skills in analyzing the thermodynamic cycles of steam power plants and understanding their construction. The development of research principles begins and is developed through the implementation of practical assignments, which are either integrated into lecture units or delivered through specialized practical units, research seminars and tutorials. In levels 5 to 8, students acquire comprehensive knowledge and skills related to equipment and reactor design. They develop the ability to analyze and solve problems. In addition, they acquire knowledge of software applications and do their own study to meet final project requirements.

3. Program Objectives

- PEO1:** competently apply engineering methods to solve professional problems associated with the design, development, manufacture, and maintenance of Fuel and Energy Engineering Techniques and related systems and understand the social, ethical, and environmental context of their work.
- PEO2:** communicate effectively with diverse and international communities, collaborate competently in cross-functional teams, and assume leadership roles while meeting the expectations of their employers.
- PEO3:** habitually engage in technical professional development.

4. Student Learning Outcomes

The **FEE** program provides students with a solid foundation in the fuel and energy technology field, envisaging various employment capabilities and careers. Graduates have knowledge and skills in general **FEE** issues and, depending on the selected specialization, the knowledge and technical skills of **FEE**. They know the principles of fuel and sustainable energy and are well acquainted with the devices cooperating with refineries, power stations, and other related processes. They have knowledge of unit operation, measurement, and control engineering; they develop software skills



and know how to design equipment and reactors They also have a basic knowledge of problems related to internal combustion engines and understand internal combustion engine methods and applications. They had the ability to deal with risks such as pollution, identify and assess risks in the workplace, and estimate damage and risks as a result of the explosion.

1. an ability to identify, formulate, and solve complex engineering problems in fuel and energy field by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

5. Academic Staff

Scientific Rank and Name	Certificate	Position	E-Mail	Notes

6. Credits, Grading and GPA

Credits

College of Technical Engineering in Alayen Iraqi University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 25 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:

$$CGPA = [(1^{st} \text{ module score} \times ECTS) + (2^{nd} \text{ module score} \times ECTS) +] / 201$$

Note:

- SAU – Support Alayen University – University Requirements.
- ETC – Engineering Technical College – College Requirements.
- FEE – Fuel and Energy Engineering Techniques Departments.



7. Curriculum/Modules

Year 1 - Semester 1 | 25 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
BETC102	Calculus	92	83	7	B	
SAU102	Human Rights	32	18	2	S	
FEE110	Analytical Chemistry	108	67	7	C	
BETC106	Engineering Drawing	93	57	6	B	
SAU101	English Language 1	32	18	2	S	
BETC107	Physics	62	88	6	B	

Year 1 - Semester 2 | 25 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
BETC108	Engineering Mechanics	62	113	7	B	
FEE111	Principals of Chemical Processes	77	73	6	C	
FEE112	Organic Chemistry	108	67	7	C	
SAU103	Computer Fundamentals 1	48	27	3	S	
FEE113	Engineering Statistics	17	33	2	S	
BETC103	Engineering Workshop	93	57	6	B	

Year 2 - Semester 3 | 25 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
BETC203	Engineering Mathematics	62	88	6	B	
FEE205	Calculation of Chemical Processes	77	73	6	C	
FEE206	Physical Chemistry	93	57	6	C	
FEE207	Properties of Eng. Materials	62	38	4	C	
SAU203	Crimes of the defunct Ba'ath Regiem	48	2	2	S	
FEE208	Petroleum Refining	93	57	6	C	

Year 2 - Semester 4 | 25 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
BETC204	Differential Equations	62	88	6	B	
FEE209	Fluid Mechanics	108	92	8	C	
FEE210	Energy Sources	77	48	5	C	
SAU201	English Language2	32	18	2	S	
FEE211	Energy Balances	77	73	6	C	
SAU202	Computer Fundamental 2	48	27	3	s	

**Year 3 - Semester 5 | 25 ECTS | 1 ECTS = 25 hrs.**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
FEE304	Heat Transfer 1	78	72	6	C	
FEE305	Mass Transfer 1	78	72	6	C	
BETC302	Engineering Analysis	62	38	4	B	
FEE306	Thermodynamics	108	42	6	C	
FEE307	Gas Technology	77	73	6	C	
SAU301	English Language 3	32	18	2	B	

Year 3 - Semester 6 | 25 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
FEE308	Heat Transfer 2	78	72	6	C	
FEE309	Mass Transfer 2	78	72	6	C	
FEE310	computer programming	63	37	4	C	
FEE311	Internal Combustion Engines	108	92	8	C	
BETC303	Numerical Methods	62	38	4	B	
FEE312	Industrial Safety	32	18	2	S	

Year 4 - Semester 7 | 25 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
FEE404	Power Plants Engineering	77	73	6	C	
FEE405	Chemical Reactor Design 1	47	53	4	C	
FEE406	Measurement and Control Engineering	108	42	6	C	
FEE407	Plant & Equipment Design	92	58	6	C	
FEE408	Combustion Technology	62	88	6	C	
BETC402	Engineering Project 1	47	3	2	C	

Year 4 - Semester 8 | 25 ECTS | 1 ECTS = 25 hrs.

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
FEE409	Industrial Unit Operation	108	92	8	C	
FEE410	Chemical Reactor Design 2	47	53	4	C	
FEE411	Process Modeling & Simulation	93	57	6	C	
FEE412	Renewable Energy	108	92	8	C	
BETC403	Engineering Project2	47	3	2	C	
SAU401	English Language4	32	18	2	B	



8. Contact

Program Manager:

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