



جامعة العين العراقية

ALAYEN IRAQI UNIVERSITY



الكلية التقنية الهندسية

College of Technical Engineering

بكالوريوس هندسة – تقنيات هندسة ميكانيك القوى

بكالوريوس علوم – تقنيات هندسة ميكانيك القوى



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1. Mission & Vision Statement

Vision Statement

Preparing highly qualified, creative, and competent engineering professionals with strong scientific knowledge, practical skills, and ethical values in the field of **Power Mechanical Engineering**. The department aims to develop graduates capable of addressing modern engineering challenges, applying advanced technologies, and contributing effectively to industrial development and community service.

Mission Statement

Graduating skilled technical engineers in **Power Mechanical Engineering** through providing a distinguished academic environment, updated educational programs, and specialized teaching staff. The department focuses on enhancing students' scientific capabilities, practical experience, innovation, and professional responsibility to meet the requirements of the labor market, support sustainable development, and contribute to solving engineering problems through multidisciplinary cooperation.

2. Program Specification

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

providing them with advanced knowledge and practical skills in thermal systems, energy conversion, and mechanical equipment. The program enables students to understand the principles of thermodynamics, fluid mechanics, heat transfer, power generation systems, and the operation and maintenance of mechanical systems.

The curriculum integrates fundamental and advanced engineering concepts to develop students' abilities in analyzing, designing, and improving power systems and industrial equipment. Students gain experience in conventional and renewable energy technologies, power plants, refrigeration and air conditioning systems, and modern engineering applications required in the industrial sector.

At the early levels, students acquire basic knowledge in mathematics, physics, engineering sciences, and fundamental mechanical concepts that support their academic progression. In the following levels, specialized courses focus on thermal engineering, energy systems, internal combustion engines, turbines, pumps, and mechanical design. Practical training, laboratory experiments, and engineering projects enhance students' problem-solving skills and technical capabilities.

In the advanced stages of study, students develop comprehensive skills in the analysis, design, and optimization of mechanical power systems using modern engineering tools and software. Graduates are prepared to meet market requirements, contribute to industrial development, and provide effective engineering solutions through innovation, research, and professional practice.

3. Program Objectives

PEO1:

Apply engineering principles and methods effectively to analyze, design, develop, operate, and maintain power mechanical systems and related engineering applications while considering professional, ethical, social, and environmental responsibilities.

PEO2:

Communicate effectively with diverse professional communities, work efficiently within multidisciplinary teams, and demonstrate leadership skills to meet the requirements of employers and the mechanical power industry.

PEO3:

Continuously enhance technical knowledge and professional skills through lifelong learning, advanced training, and engagement with emerging technologies in power mechanical engineering fields.

4. Student Learning Outcomes

Program Description – Power Mechanical Engineering

The **Power Mechanical Engineering program** provides students with fundamental and advanced knowledge in thermal systems, energy conversion, mechanical power generation, and related engineering applications. Graduates acquire the ability to analyze, design, operate, and maintain mechanical power systems, including engines, turbines, refrigeration and air conditioning systems, and industrial equipment. The program develops students' skills in thermodynamics, fluid mechanics, heat transfer, mechanical design, instrumentation, and engineering software tools. Graduates are prepared to address engineering challenges, improve energy efficiency, ensure safety, and apply sustainable solutions in industrial and power-related fields.

Program Learning Outcomes (PLOs)

1. Ability to identify, analyze, and solve complex engineering problems in power mechanical systems using principles of engineering, science, and mathematics.
2. Ability to design mechanical power systems and develop engineering solutions considering safety, environmental, economic, and societal requirements.
3. Ability to communicate effectively through technical reports, presentations, and professional interactions.
4. Ability to understand and apply ethical and professional responsibilities while considering the impact of engineering solutions on society and the environment.

5. Ability to work effectively within multidisciplinary teams, demonstrate leadership, and achieve project objectives.
6. Ability to conduct experiments, analyze engineering data, and apply appropriate methods to evaluate mechanical power systems.
7. Ability to acquire and apply new knowledge through continuous learning and adaptation to emerging technologies in mechanical power engineering.

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:

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

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
ATUU113	English for Academic U.	18	32	2.00	S	
ATU1111	Computer	48	27	3.00	S	
ATU12013	Single Variables Calculus	63	62	5.00	B	
ATU12014	Workshop	63	37	4.00	C	
ATU12015	Engineering physics	78	47	5.00	B	
ATU12016	CAD Drawing	120	55	7.00	S	
ATUU111	Human Right and Democracy	33	17	2.00	B	
ATUU112	Arabic language	18	32	2.00	B	

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

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU12021	Multi-Variables Calculus	78	72	7	6.00	
ATU12022	Engineering Materials	63	37	6	4.00	
ATU12023	Fundamentals of Thermodynamics	78	72	7	6.00	
ATU12024	Engineering Mechanics-Static	123	77	3	8.00	
ATU12025	Fundamentals of Electricity	78	72		6.00	

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

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU12031	Fluid Mechanics -Static	78	47	5.00	C	
ATU12032	Advanced automotive technology	63	62	5.00	S	
ATU2222	Computer	63	12	3.00	S	
ATU12034	Thermodynamic - Ideal Gas	78	47	5.00	C	
ATU12035	Manufacturing Processes	63	62	5.00	S	
ATU12036	Fundamentals of Engineering Mechanics-Dynamics	78	47	5.00	C	
ATU24	The crimes of the Baath regime in Iraq	33	17	2.00	S	

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

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU12041	Fluid Mechanics-Dynamics	78	22	4.00	C	
ATU12042	Internal Combustion Engine	78	22	4.00	C	
ATU12043	Engineering Mechanics-Applied of Dynamics	63	62	5.00	S	
ATU12044	Strength of Materials	93	32	5.00	S	
ATU12045	Linear algebra	63	37	4.00	B	
ATU12046	Thermodynamic - Gas cycle	78	22	4.00	C	
ATUU213	English for Academic U.	18	32	2.00	S	
ATUU212	Arabic language	18	32	2.00	B	

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

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU12051	Steam Power Plant	93	55	6.00	C	
ATU12052	Heat Transfer- conduction	108	42	6.00	C	
ATU12053	Numerical Analyses	63	62	5.00	B	
ATU12054	Gas Dynamics	63	62	5.00	C	
ATU12055	Mechanical Vibrations	63	62	5.00	B	
ATU12056	Professional Ethics	33	42	3.00	S	

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

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU12061	Control Engineering Fundamentals	78	47	5.00	C	
ATU12062	Vehicle Parts Design	108	42	6.00	S	
ATU12063	Heat Transfer- convection	93	57	6.00	C	
ATU12064	Eng. & Numerical Analyses	63	62	5.00	B	
ATU12065	Hydraulic and Turbomachinery systems	63	37	4.00	C	
ATU12066	Theory of Machines	48	52	4.00	C	

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

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU12071	Computational Fluid Dynamics	48	27	3.00	C	
ATU12072	Refrigeration systems	108	92	8.00	C	
ATU12073	Energy Resources and Conservation	48	52	4.00	C	
ATU12074	systems design	48	52	4.00	C	
ATU12075	Advanced Control Systems	108	42	6.00	C	
ATU12076	CAM (computer Aided manufacturing)	63	62	5.00	S	

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

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU12081	Air-Conditioning systems	108	92	8.00	C	
ATU12082	Conventional and Renewable power plant	93	57	6.00	C	
ATU12083	Equipment Technology	78	72	6.00	S	
ATU12084	Industrial Engineering	48	27	3.00	S	
ATU12085	Computational Modelling	48	52	4.00	S	
ATU12086	Final Project	63	12	3.00	C	

8. Contact

Program Manager:

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