

**Al-Furat Al-Awsat Technical University,
Al-Mussaib Technical College,
Power Mechanics Technical Engineering
Department**



جامعة الفرات الأوسط التقنية
الكلية التقنية المسيب
قسم هندسة تقنيات ميكانيك القدرة

**First Cycle – Bachelor's degree (B.Sc.) – Power Mechanics
Technical Engineering**

بكالوريوس هندسة تقنيات ميكانيك القدرة



Table of Contents

جدول المحتويات

1. Mission & Vision Statement	بيان المهمة والرؤية
2. Program Specification	مواصفات البرنامج
3. Program (Objectives) Goals	أهداف البرنامج
4. Program Student learning outcomes	مخرجات تعلم الطالب
5. Academic Staff	الهيئة التدريسية
6. Credits, Grading and GPA	الاعتمادات والدرجات والمعدل التراكمي
7. Modules	المواد الدراسية
8. Contact	اتصال

1. **Mission & Vision Statement**

Vision Statement

The academic staff of the power mechanics technical engineering department of Al-Mussaib Technical College at Al-Furat Al-Awsat Technical University believe that students come to understand the disciplines of turbo machinery in mechanical engineering through a combination of course work, laboratory experiences, research, and fieldwork. The combination of instructional methods leads students to a balanced understanding of the scientific methods used by mechanical engineering to make observations, develop insights and create theories about the mechanical applications and innovations, particularly in turbo machinery devices. Small class sizes within the power mechanics technical engineering department foster a close working relationship between academic staff and students in an academic atmosphere.

Mission Statement

The academic staff of the power mechanics technical engineering department of Al-Mussaib Technical College pursue a multifaceted charge at Al-Furat Al-Awsat Technical University. The program seeks to provide all students in the power mechanics technical engineering department the fundamental knowledge of mechanical engineering, as well as a deeper understanding of a selected focus area within the turbo machinery devices and most important mechanical appliances.

The curriculum and advising have been designed to prepare graduates for their professional future, whether they choose to work as mechanical engineer or for those students whose seeking to complete the higher education requirements for M.Sc degree. This program aims to prepare a technical engineer qualified in the design, examination, installation and operation of devices and equipments, in addition to turbo machinery devices and accessories of all kinds.

2. Program Specification

Programme code:	B.Sc.-PME	ECTS	240
Duration:	4 levels, 8 Semesters	Method of Attendance:	Full Time

The academic program description and the learning outcomes of the student can be comprehensively achieved providing a general justification for students whose have achieved the maximum scientific opportunities available in the department. It is accompanied by a description of each course within the program of the power mechanics technical engineering department. This program prepares the technical engineering staff with qualifications in mechanical engineering and with great knowledge and development in mechanical engineering / engineering of turbo machinery. Also, the graduate has the ability to make a comprehensive maintenance of different kinds of pumps, compressors, turbines, etc. The design, operation, and installation of the above-mentioned equipments can be professionally performed by graduates. The student in the power mechanics technical engineering department learnt so much experience skills through laboratory experiments. This gaining practical experience through the field observation is enhanced the theoretical aspects and knowledge. Furthermore, this program provides the graduates by the knowledge of mechanical engineering standards and market assessments of state management concepts at work. It has the ability to work in electric power production units. The graduate has the ability to work in all industrial establishments within the specialty of mechanical engineering, such as oil production, laboratories and production companies. For all levels of this program, the courses and curriculum can be classified to be as core, basic, or support, and this depends on the nature of the basic scientific concepts of the academic subjects and on the extent to which the student needs information that enhances his/ her understanding and awareness.

Level 1 exposes students to the fundamentals of mechanical engineering, suitable for progression to all programmes within this programme group. Programme-specific core topics are covered at Level 2 preparing for research-led subject specialist modules at Levels 3 and 4. The University graduate is therefore trained to appreciate how research informs teaching, according to the University and School Mission statements.

At Levels 2, 3 and 4 students learn new and more specialized information gradually in this program. For example, the student will learn the principles of fluid dynamics, heat dynamics, metals, strength of materials, as well as heat transfer, gas dynamics, etc., so that the student will be scientifically prepared to study and learn lessons and other more specialized subjects, such as electric power plants, control, production processes, refrigeration, air conditioning, production management, and other

complementary subjects for this program. These subjects will qualify the graduate to obtain a bachelor's degree in this mechanical specialty. Then the student is qualified to work as a mechanical engineer, or the student can complete the higher university studies. In these three levels, students are free to choose more than half of their module credits. Decisions on what to study are made with input from personal tutors.

The research and innovation aspect during the student's study will have a significant impact on the development of the student's theoretical and practical abilities, especially during experiments and work on developing design and manufacturing skills for various mechanical devices and linking them to the mathematical principles acquired from the theoretical side. There is a compulsory field course in Level 1, which students must pass in order to progress into Level 2, and optional field courses in Levels 2, 3 and 4. At Level 4 all students carry out an independent research project, which may be performed experimentally and/or numerically.

Different academic tutorials are held at Levels 1,2,3, and 4 in order to provide continuity and progressive guidance. Level 1 and 2 tutorials include a number of workshops to teach skills, e.g. library use, solved problems and presentation skills, followed by assessed exercises, e.g. essays, scientific report and presentation, as opportunities to practice these skills in a subject-specific context.

A number of scientific visits and trips to various electric power plants, production factories, pumping stations, water desalination plants, etc. will be part of the curriculum during the four years of this program in order to enhance the acquisition of practical and scientific skills, in addition to practical summer training (summer internship) within one of the sites mentioned above, and this takes place during the second and third levels.

3. Program Objectives

A- Cognitive goals

- 1- Teaching students the mechanical engineering of pumps, compressors, and turbines etc. creating a generation of engineers familiar with all types of turbo machinery devices.
- 2- Spreading knowledge awareness in mechanical engineering / engineering techniques of turbo machinery devices.
- 3- Work on the maintenance of turbo machinery devices and knowledge of mechanical engineering standards and others mechanical applications.

B - The goals and skills of the program

- 1 - Preparing technical engineering staff qualified in designing, examining, installing and maintaining various types of turbo machinery devices and their accessories, and upgrading these types.
- 2 - It has the ability to work in electrical energy units, production companies and manufacturing units and oil companies.
- 3 - Proficiency in working in the public sector in associations specialized in mechanical engineering / engineering turbo machinery technologies.

4. Student Learning Outcomes

Power mechanics engineering is the study of physical machines that may involve force, movement, and energy. It is an engineering branch that combines engineering physics and mathematics principles with thermo physics properties, materials science and fluids, to design, analyze, manufacture, and maintain mechanical systems. Power mechanics engineering requires an understanding of core areas including mechanics, dynamics, thermodynamics, materials science, design, heat transfer, fluid mechanics, and electricity. In addition to these core principles, mechanical engineers use tools such as computer-aided design (CAD), computer-aided manufacturing (CAM), and product management to design and analyze manufacturing plants, industrial equipment and machinery, heating and cooling systems, transport systems, aircraft, watercraft, robotics, and others. Graduates have the ability to develop and conduct appropriate experimentation in a wide range of engineering applications such as electric generators, internal combustion engines, and steam and gas turbines, as well as power-using machines, such as refrigeration and air-conditioning systems. Furthermore, the department offers to power mechanical engineers to prepare technical engineering cadres qualified in the design, examination, installation and operation of devices and machines turbines, mechanical equipment and accessories of all kinds. Also, the graduates can pursue their higher education (M.Sc. degree) at the same department (power mechanics engineering) to gain more experiences and skills in this mechanical engineering field.

Outcome 1

The graduate has the ability to observe, comprehend, analyze and interpret most of the engineering problems in the field of power mechanics.

Outcome 2

The graduate has the ability to use the acquired knowledge in the design of various turbine machines.

Outcome 3

The graduate has the ability to conclude and evaluate in solving engineering problems.

Outcome 4

The graduate has the ability to evaluate numerical data and apply analytical methods for the purposes of mechanical design, manufacturing methods and product control.

Outcome 5

The graduate has the ability to study and evaluate engineering projects in groups.

Outcome 6

The graduate has the ability to scientifically analyze and interpret laboratory results and field tests at work sites.

5. Academic Staff

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6. Credits, Grading and GPA

Credits

Al-Furat Al-Awsat Technical University 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:				
<p>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.</p>				

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:

$$\text{CGPA} = [(1^{\text{st}} \text{ module score} \times \text{ECTS}) + (2^{\text{nd}} \text{ module score} \times \text{ECTS}) + \dots] / 240$$

7. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU24011	English for Academic(Level 1)	18	32	2	S	
ATU24012	Computer Principals	48	27	3	S	
ATU24013	Mathematics -I	63	87	6	B	
ATU24014	Workshop	93	82	7	C	
ATU24015	Fundamentals of Engineering Mechanics-Statics	48	102	6	C	
ATU24016	Engineering Drawing (Fundamentals)	87	63	6	C	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU24021	Human Right and Democracy	18	32	2	B	
ATU24022	Mathematics -II	63	87	6	B	ATU24013
ATU24023	Engineering Materials	33	67	4	C	

ATU24024	Fundamentals of Engineering Mechanics-Dynamics	48	102	6	C	ATU24015
ATU24025	Engineering Drawing (CAD Drawing)	87	63	6	C	ATU24016
ATU24026	Fundamentals of Electricity	93	57	6	S	
ATU11	Arabic Language	33	17	2	S	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU24031	Fluid Mechanics -static	63	87	6	C	
ATU24032	Electrical Engine	63	62	5	S	ATU24026
ATU24033	Mechanical Engineering Drawing	33	67	4	C	ATU24025
ATU24034	Fundamentals of Thermodynamics	78	72	6	C	
ATU24035	English for Academic(Level 2)	18	32	2	S	ATU24011
ATU24036	Mathematics- III	63	62	5	B	ATU24022
ATU24037	جرائم حزب البعث	18	32	2	B	

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU24041	Fluid Mechanics-Dynamics	78	72	6	C	ATU24031
ATU24042	Metallurgy	63	62	5	S	
ATU24043	Mathematics- IV	63	62	5	B	ATU24036
ATU24044	Strength of Materials	78	47	5	S	
ATU24045	Computer2	48	27	3	S	
ATU24046	Thermodynamic - Applications	78	72	6	C	ATU24034

8. **Contact**

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