

Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation institution

Department of Quality Assurance and Academic

Accreditation

Accreditation Department



**Description of the academic program of the Power Mechanical
Technology Engineering Department for the academic year
2024-2025**

University name: Al-Furat Al-Awsat Technical University

College/Institute: Technical College - Mussiab

Scientific Department: Department of Power Mechanical Technology
Engineering

Name of the academic or professional program: Bachelor's degree

Name of final degree: Bachelor of Mechanical Power Technology
Engineering

Academic system: Annual

Description preparation date: 29/09/2024

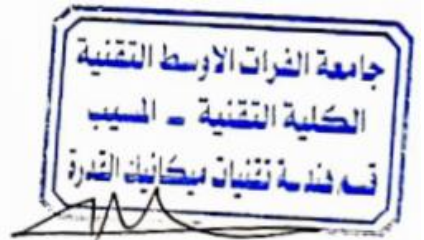
Date of filling the file: 31/09/2024

The signature:

Name of scientific assistant Dean:

Prof. Dr. **Nabil Hamid Abdel Majeed**

Date / /2024



The signature:

Name of Department Head:

Assist. Prof. Dr. **Malik Nama Hawass**

Date: / /2024

Check the file by:

Division of Quality Assurance and University Performance

Name of the Director of the Quality Assurance and University Performance Division:

Dr. Haider Rahman Daoud

Date: / /2024

The signature:



Authentication of the Dean

10

1 – Program vision

Keeping pace with modern scientific developments in the education program for undergraduate and postgraduate levels in the future, directing and developing scientific research, and employing applicable research energies in the fields of power and energy production.

1. Program message

Within the framework of the mission of Al-Mussaib Technical College, the department is committed to preparing technical engineers and researchers capable of contributing to the development of the power sector and the fields of energy production in its various forms.

1. Program objectives

- 1- Preparing engineering technical staff who hold qualifications in power mechanical engineering technology
- 2- Preparing scientific staff capable of keeping pace with scientific development in mechanical engineering/power mechanical technology engineering
- 3- Learn how to maintain turbine machines, generating and cooling devices
- 4- Design of equipment and machines
- 5- Learn practical applications through laboratory experiments
- 6- Gaining practical experience through field observation to enhance the theoretical aspect.

1. Programmatic accreditation

Does the program have program accreditation? no

1. Other external influences

Is there a sponsor for the program? no

1. Program structure

* comments	percentage	Study unit	Number of courses	Program structure
		195	43	Institution requirements
		185	38	College requirements
		185	38	Department requirements
For the second and third stages		2 months		Work placement (summer training)
				others

1. Program description				
Credit hours		Name of the course	course code	Year/level
-	60	Engineering Materials Tech.	PMTE111	The first
180	-	Engineering Drawing	PMTE112	
-	120	Engineering Mechanics	PMTE113	
-	90	Mathematics1	PMTE114	
60	30	Electrical technology	PMTE115	
240	-	Workshops	PMTE116	
60	30	Computer Applications 1	PMTE117	
-	60	Human Rights and Democracy	PMTE118	
-	30	English 1	PMTE119	
60	60	Strength of materials	PMTE211	The second
60	60	Fluid mechanics	PMTE212	
60	60	Thermodynamics	PMTE213	
60	60	Metallurgy	PMTE214	
-	90	Mathematics2	PMTE215	
180	-	Mechanical Drawing	PMTE216	
60	30	Computer Applications 2	PMTE217	
-	-	Training	PMTE218	
-	30	English 2	PMTE219	
60	60	Electric motors	PMTE220	
60	60	Pumps Technology	PMTE311	The third
60	60	Hydraulics	PMTE312	

60	60	Gas dynamics	PMTE313	
90	-	Turbo machinery Operation & Maintenance (1)	PMTE314	
60	60	Internal combustion engines	PMTE315	
60	60	Heat transfer	PMTE316	
60	60	Theory of Machines	PMTE317	
-	90	Engineering & Numerical Analysis	PMTE318	
60	30	Computer Applications 3	PMTE319	
-	-	Training	PMTE320	
-	30	English 3	PMTE321	
60	60	Power plants	PMTE411	
-	90	Machine design	PMTE412	
60	60	Theory of Vibration	PMTE413	
60	60	Manufacturing Processes	PMTE415	
60	60	Refrigeration and air conditioning	PMTE416	
90	-	Project	PMTE417	
60	60	Measurement & Control processes	PMTE418	
-	60	Industrial Engineering	PMTE419	
60	30	Computer Applications 3	PMTE420	
-	30	English 4	PMTE421	

1. Expected learning outcomes of the program

Knowledge	
The student's awareness of the importance of power .mechanical engineering techniques in practical life	1 - Preparing qualified technical engineering personnel to design, inspect, install, operate and maintain various types of turbine machines and their accessories. 2- Teaching students what is meant by mechanical engineering and creating a generation of engineers in the specialty of power mechanics. -3Spreading knowledge awareness related to mechanical engineering/power mechanical engineering techniques.
Skills	
General skills and qualifying the student to maintain and rehabilitate power stations	1- He has the ability to work in electrical power production units and refrigeration and air conditioning systems. -2 Proficiency in working in the public and private sectors in the specialty of mechanical engineering/power mechanical technology engineering.

Value	
Acquiring skills and experience in the field of mechanical engineering in general and the energy sector in particular.	1- Observation, perception, analysis and interpretation 2- The ability to use the acquired knowledge in designing machines, turbine machines, and cooling devices 3- Conclusion and evaluation in solving engineering problems and how to develop engineering devices and equipment 4- The ability to evaluate numerical data and apply analytical methods for the purposes of mechanical design, manufacturing methods, and product control.

1-Teaching and learning strategies

- 1- The lecture
- 2- Laboratory
- 3- Seminars and summer training
- 4- Scientific trips and seminars
- 5- Scientific books
- 6- Graduation projects

1. Evaluation methods

Conducting tests (daily, quarterly, final)
 Annual Evaluation
 Homeworks
 Quizzes.

2. The teaching staff

Faculty members

Number of the teaching staff		Special requirements/skills (if any)		field		Academic position
lecturer	Permanent staff			specialization	General specialization	
	√			Power/thermal engineering	Mechanical Engineering	Prof
	√			Applied	Mechanical	Prof.

				mechanics	Engineering	
	√			Design and manufacture	Mechanical Engineering	Assist. Prof.
	√			Applied mechanics	Mechanical Engineering	Assist. Prof.
	√			Power/thermal engineering	Mechanical Engineering	Assist. Prof.
	√			Power/thermal engineering	Mechanical Engineering	Assist. Prof.
	√			Applied mechanics	Mechanical Engineering	lecturer
	√			Power/thermal engineering	Mechanical Engineering	lecturer
	√			Power/thermal engineering	in MSc Mechanical Engineering	lecturer
	√			Power/thermal engineering	in MSc Mechanical Engineering	Assist. lecturer

Professional development

Orienting new faculty members

They are defined as members who are newly hired by the university and are within their first year of academic service. A faculty member in his second year is eligible to participate if he is nominated by the deanship.

Professional development for faculty members

The ability of teachers is developed by involving them in teaching methods courses held at the Faculty Development Center, as well as by holding seminars at the department level, where each teacher is assigned to prepare a seminar on one of the scientific topics, and it is delivered in the presence of the teaching staff in the department. The topic is discussed and notes are recorded. Necessary, as this is useful in refining the teacher's personality and helping him in managing discussion, defense, and expressing opinion, which would help raise the academic level of the teacher and develop his capabilities. Also, in recent years, many of the department's teachers have participated in courses inside and outside the country that have had a

positive impact in increasing knowledge and developing skills. Most of the department's teachers also participate annually in many scientific conferences held by Iraqi universities as researchers or as participants.

3. Acceptance criterion

Inputs:-

1. Graduates of preparatory school, scientific branch.
2. The top five students are graduates of vocational training/mechanics branch.
3. The top ten students who are graduates of technical institutes and distinguished state employees are graduates of the Technical Education Authority for the following specializations:
 - Machinery and Equipment Department - Pump Operation Branch.
 - Machinery and Equipment Department - Automotive Branch.
 - Mechanics Department - Production Branch.
 - Mechanics Department - Power or Capacity
4. The top ten distinguished employees of state departments are graduates of the Petroleum Training Institute for the following specializations:
 - Mechanics Department - Pumps and Turbine Branch.

 - Mechanics Department - Automotive and Heavy Equipment Branch.

Admission system: -

Students are accepted through central admission at the Ministry of Higher Education and Scientific Research in two stages, as follows:

1. The first grade includes graduates of preparatory school in the scientific stream, as well as the top graduates of vocational education in the specializations that can be accepted into the specialization.
2. The second grade is accepted:
 - ☐ The top ten graduates of the technical institutes specified in the specialization entries.
 - ☐ Distinguished people in the field of work in the specializations specified in the entries.
 - ☐ The top ten graduates of the institute for the specializations specified in the specialization entries, including the Department of Power/Power Mechanics

3. The most important sources of information about the program

The official website of the college

<https://cms.atu.edu.iq>

Mussaib Technical College/Babylon

3. Program development plan

The Mechanical Technology Engineering Department works to develop the student's practical skills and increase his confidence in his scientific capabilities. The curricula are updated by 20% annually by the subject teacher, and periodic updating follows the Deans' Committee.

مخطط مهارات البرنامج																		
Level	Semester	.No	Module Code	Module Name in English	Module Type	Required program Learning outcomes												
						Knowledge				Skills				Ethics				
						A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	
1 st	One	1	PME111	English for Academic(Level 1)	S	*				*	*				*			
		2	PME112	Computer Principals	B	*				*				*				
		3	PME113	Mathematics -I	B	*				*							*	
		4	PME114	Workshop	C		*			*					*			
		5	PME115	Fundamentals of Engineering Mechanics-Statics	C	*				*					*			
		6	PME116	Engineering Drawing (Fundamentals)	S	*						*			*			
	Two	1	PME121	Human Right and Democracy	B		*			*								
		2	PME122	Mathematics -II	B	*				*								*
		3	PME123	Engineering Materials	S													
		4	PME124	Fundamentals of Engineering Mechanics-Dynamics	C	*				*					*			
		5	PME125	Engineering Drawing (CAD Drawing)	S	*						*			*			
		6	PME126	Fundamentals of Electricity	S	*				*	*				*			
2 nd	Three	1	PME211	Fluid Mechanics -static	C	*					*				*			
		2	PME212	Electrical Engine	S	*				*	*				*			
		3	PME213	Mechanical Engineering Drawing	S	*						*			*			
		4	PME214	Fundamentals of Thermodynamics	C	*				*				*				
		5	PME215	English for Academic (Level 2)	S	*				*	*				*			
		6	PME216	Mathematics- III	B	*				*								*
	Four	1	PME221	Fluid Mechanics-Dynamics	C	*					*				*			
		2	PME222	Metallurgy	S	*					*				*			
		3	PME223	Mathematics- IV	B	*				*								*
		4	PME224	Strength of Materials	S	*				*						*		
		5	PME225	Programming (Mat Lab)	S	*						*			*			
		6	PME226	Thermodynamic - Applications	C	*				*				*				

rd3	Five	1	PME311	Hydraulics	C	*	*		*					*						
		2	PME312	Internal Combustion Engine	C	*	*		*						*					
		3	PME313	Analyses Engineering	S	*					*					*				
		4	PME314	Gas Dynamics	C	*	*		*							*				
		5	PME315	Heat Transfer (conduction)	C	*	*		*							*				
		6	PME316	English for Academic(Level 3)	S	*				*	*						*			
	Six	1	PME321	pumps Technology	C	*	*		*						*					
		2	PME322	Turbo-Machinery Operation and Maintenance	C	*	*		*							*				
		3	PME323	(Radiation & Heat Transfer (Convection	C	*	*		*							*				
		4	PME324	(D Auto CAD-3) Programming	S	*						*					*			
		5	PME325	Analyses Numerical	S	*					*						*			
		6	PME326	Theory of Machines	S			*		*				*						
th4	Seven	1	PME411	Steam Power Plants	C	*	*		*						*					
		2	PME412	Theory Vibration	S			*		*				*						
		3	PME413	Refrigeration and Air Conditioning	C	*	*		*							*				
		4	PME414	Manufacturing Processe	S	*				*						*				
		5	PME415	Programming (Solid Work)	S	*						*					*			
		6	PME416	Project	C	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	Eight	1	PME421	Machine Design	S			*		*				*						
		2	PME422	Measuring and Control Devices	C	*				*						*				
		3	PME423	Hydraulic Power Plants	C	*	*		*							*				
		4	PME424	the industrial engineering	S	*				*						*				
		5	PME425	English for Academic(Level 4)	S	*				*	*						*			
		6	PME426	Final Project	C	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Course description form

1. Name of the course					
Pumps technology					
1. Course code					
PMTE311					
2. Semester/year					
annual					
2. The date this description was prepared					
2024/2/25					
2. Available forms of attendance					
Theoretical and practical lectures and scientific trips					
2. Number of study hours (total)/number of units (total)					
4 hours					
2. Name of the course administrator (if more than one name is mentioned)					
Name: Lecturer Doaa Fadel Karim Email: Doaa.fadhli.tcm@atu.edu.iq					
2. Course objectives					
<ul style="list-style-type: none"> • Introducing the student to hydraulic calculations for pumps and their types • Classifying them and identifying the internal parts, the function of each part and their relationship • With the rest of the parts for turbine engines. • Studying the theory of centrifugation, on which the operation of pumps depends, and studying the properties of pumps • Performance curves and their relationships. • Choose the type and specifications of pumps required for any situation. Identify the types of valves and their parts • The interior and function of each valve and its uses. 					Objectives of the study subject
2. Teaching and learning strategies					
					The strategy
3. Course structure					
Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Daily and	Theoretical	Power shaft		8	2-1

monthly exams and reports	and practical lectures and scientific films	hydraulic calculations			
Daily and monthly exams and reports	Theoretical and practical lectures and scientific films	Types of pumps and ways to classify them		16	6-3
Daily and monthly exams and reports	Theoretical and practical lectures and scientific films	Internal components of a centrifugal pump		20	11-7
Daily and monthly exams and reports	Theoretical and practical lectures and scientific films	Centrifugal pumps/theory and application		16	-12 15
Daily and monthly exams and reports	Theoretical and practical lectures and scientific films	relationships and properties of centrifugal pumps		12	-16 18
Daily and monthly exams and reports	Theoretical and practical lectures and scientific films	Performance curves/choosing the best operating point		16	-19 22
Daily and monthly exams and reports	Theoretical and practical lectures and scientific films	Connect the pumps in series and parallel		4	23
Daily and monthly exams and reports	Theoretical and practical lectures and scientific films	Positive displacement pumps		8	-24 25
Daily and monthly exams and reports	Theoretical and practical lectures and scientific	Valves		12	-26 28

	films				
Daily and monthly exams and reports	Theoretical and practical lectures and scientific films	Cavitation in pumps		4	29
Daily and monthly exams and reports	Theoretical and practical lectures and scientific films	Methods for choosing the appropriate pump		4	30

3. Course evaluation

Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

The final grade	Final exam			Annual quest	year works		Second course			First course			Subject
	Sum	Pra	Th		Report	Total	Sum	Pra	Th	Sum	Pra	Th	
100	50	10	40	50	5	5	20	10	10	20	10	10	Theory and practical

3. Learning and teaching resources

	(Required textbooks (methodology, if any
Bhattacharya S.C., Hydraulic machines, shri B.V. Gupta, Delhi, 1975.	(Main references (sources
<ol style="list-style-type: none"> 1. John A. Roberson, Hydraulic Engineering, John Wily& Sons, USA, 1998. 2. Jain V.K., Pumps Theory and Practice, Galgotia Booksource, New Delhi, 1987. 	Recommended supporting books and references (scientific journals, reports...)
http://www.tkne.net https://www.youtube.com/education	Electronic references, Internet sites