Northern Technical University(NTU)/
Eng. Technical College- Mosul (TEMO) –
Department of Applied Mechanics Techniques Engineering (AM)

الجامعة التقنية الشمالية

First Cycle – Bachelor's degree (B.Eng.) –Applied Mechanics Techniques Engineering

بكالوريوس هندسة تقنيات الميكانيك التطبيقي

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1. Mission & Vision Statement

Vision Statement

The department was established in 1998 under the name "Department of Refrigeration and Air Conditioning Engineering." In 2018, the department's title was revised to "Department of Power Mechanical Engineering," expanding its scope to encompass three specialized scientific branches based on the credit hours system. These branches are:

- Refrigeration and Air Conditioning Branch.
- Renewable Energy Branch.
- Production and Automation Branch.

In 2022, the Production and Automation Branch was separated to become an independent department due to its distinctive human and material resources. It was named the "Department of Applied Mechanical Techniques Engineering" The department welcomes students in both morning and evening sessions for the academic year 2023/2024, following the global Bologna system, which has been officially adopted by the ministry as the latest educational system. Additionally, the department provides opportunities for postgraduate studies, including a Master's in Applied Mechanical Techniques Engineering for the academic year 2024/2025.

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Mission Statement

Providing an ideal learning environment for students involves combining theoretical and practical aspects through organizing valuable scientific lectures in specialized fields, conducting interactive laboratory experiments that enhance hands-on learning. Additionally, engaging students in creative scientific research connected to both local and global environments, with the aim of serving the community and offering innovative engineering solutions to develop their skills and experiences, meets the evolving needs of the job market.

2. Program Specification

Program code:	PM	**ECTS**	240
Duration:	4 levels, 8 Semesters	**Method of Attendance:**	Full Time

Applied Mechanics Techniques Engineering is the study of forces, deformation, and motions of solid bodies and energy generation and transport. Mechanical engineers are equipped with knowledge to design and develop everything you think of as a device, mechanism, or machine, including wind turbines, rocket engines, robots, 3D printers, micro-engines, nanomotors, and more. We assure safety in systems people use day to day, from transportation to appliances to medical devices.

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

The research ethos is developed and fostered from the start via practical, which are either embedded in lecture modules or taught in laboratories, research seminars and tutorials. At Level 4 all students carry out an independent research project, which may be a xx-credit library or data analysis project, or a xx credit field or laboratory based project.

Academic tutorials are held at all Levels. Level 1 and 2 tutorials include a number of workshops to teach skills, e.g. report writing and presentation skills, followed by assessed exercises, e.g. essays and seminars, as opportunities to practice these skills in a subject-specific context.

3. Program Objectives

The department aims to provide high-quality technical education by keeping pace with the rapid technological advancements worldwide. This includes modernizing the curriculum to establish the foundations of technological progress. The department also strives to equip graduates with skills and experiences that meet market demands, ensuring and confirming the quality of educational outcomes for future engineering professionals.

The department looks forward to graduating distinguished applied engineers in the field of modern applications and devices, capable of:

1. Graduating students capable of simulating the job market with initial knowledge and skills.
2. Designing and implementing installation and operation plans for modern devices.
3. Installing and operating devices and machines based on correct principles in line with the vision of designing and manufacturing companies.
4. Contributing to and supervising the maintenance of various devices and units.
5. Researching, developing, and finding alternative parts for units that may experience malfunctions.

6. Working according to the methodology of preventive maintenance and activating its mechanisms systematically.

4. Student Learning Outcomes

The Applied Mechanics Techniques Engineering Department's student outcomes reflect the skills and abilities that the curriculum is designed to provide to students by the time they graduate. These are

Outcome 1

Identification of Complex Relationships

Graduates will be able to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

Outcome 2

Team work

Graduates will be able to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

Outcome 3

Laboratory Studies

Graduates will be able to perform laboratory experiments, by using scientific equipment and computer technology while observing appropriate safety protocols.

Outcome 4

Scientific Knowledge

Graduates will be able 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.

Outcome 5

Data Analyses

Graduates will be able to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

Outcome 6

Critical Thinking

Graduates will be able to use critical-thinking and problem-solving skills to develop a research project and/or paper.

1. Academic Staff

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2. Credits, Grading and GPA

Credits

Northern 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 hr. 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 = [(1st module score x ECTS) + (2nd module score x ECTS) + ……] / 240

3. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hr.

Code	Module	SSWL	USSWL	SWL	ECTS	Module Type	Pre-request
NTU 100	Democracy and Human Rights	33	17	50	2.00	B	
NTU 101	English Language	33	17	50	2.00	B	
TEMO 100	Mathematics Principles	67	108	175	7.00	C	
TEMO 101	Electrical Technology	93	57	150	6.00	C	
TEMO 102	Workshop	108	42	150	6.00	C	
AM 100	Mechanical Engineering / Statics 1	63	112	175	7.00	C	

Semester 2 | 30 ECTS | 1 ECTS = 25 hr.

Code	Module	SSWL	USSWL	SWL	ECTS	Module Type	Pre-request
NTU 102	Computer	48	27	75	3.00	B	
NTU 103	Arabic Language	33	17	50	2.00	B	
TEMO 103	Engineering Drawing	63	112	175	7.00	C	
AM 101	Mechanical Engineering / Statics 2	63	112	175	7.00	C	
AM 102	Thermodynamics Principles	78	97	175	7.00	C	
AM 103	Occupational Safety	31	69	100	4.00	C	

Semester 3 | 30 ECTS | 1 ECTS = 25 hr.

Code	Module	SSWL	USSWL	SWL	ECTS	Module Type	Pre-request
NTU 200	Baath's crimes in Iraq	33	17	50	2.00	B	
TEMO 200	Mathematics	63	112	175	7.00	C	
AM 200	Engineering Materials	93	82	175	7.00	C	
AM 201	Fluid Mechanics	93	82	175	7.00	C	
AM 202	Mechanical Drawing	63	112	175	7.00	C	

Semester 4 | 30 ECTS | 1 ECTS = 25 hr.

Code	Module	SSWL	USSWL	SWL	ECTS	Module Type	Pre-request
TEMO 201	Electric and Electronic Engineering	78	97	175	7.00	C	
AM 203	Strength of Materials	93	132	225	9.00	C	
AM 204	Engineering Mechanics- Dynamics	78	147	225	9.00	C	
NTU 202	Computer	63	12	75	3.00	B	
NTU 203	Arabic language	33	17	50	2.00	B	

Semester 5 | 30 ECTS | 1 ECTS = 25 hr.

Code	Module	SSWL	USSWL	SWL	ECTS	Module Type	Pre-request
AM 300	Numerical & Engineering Analysis	63	87	150	6.00	C	
AM 301	Computer Applications 2	78	72	150	6.00	C	
AM 302	Vibration	78	72	150	6.00	C	
AM 303	Machine Design	78	72	150	6.00	C	
AM 304	Technology of Materials	63	87	150	6.00	C	

Semester 6 | 30 ECTS | 1 ECTS = 25 hr.

Code	Module	SSWL	USSWL	SWL	ECTS	Module Type	Pre-request
AM 305	Metal Forming	63	87	150	6.00	C	
AM 306	Manufacturing Processes	63	87	150	6.00	C	
AM 307	Measurement Systems	63	87	150	6.00	C	
AM 308	Theory of Machine	93	57	150	6.00	C	
AM 309	Computer Applications 3	78	72	150	6.00	C	

Semester 7 | 30 ECTS | 1 ECTS = 25 hr.

Code	Module	SSWL	USSWL	SWL	ECTS	Module Type	Pre-request
NTU 400	Research Methodology	33	17	50	2.00	B	
AM 400	Control systems	93	82	175	7.00	C	
AM 401	Programming Language	78	97	175	7.00	C	
AM 402	Industrial Automation	78	97	175	7.00	C	
AM 403	Hydraulic and Pneumatic systems	78	97	175	7.00	C	

Semester 8 | 30 ECTS | 1 ECTS = 25 hr.

Code	Module	SSWL	USSWL	SWL	ECTS	Module Type	Pre-request
TEMO 400	Project	47	**3**	50	2.00	C	
TEMO 401	Engineering and Industrial Management	48	127	175	7.00	C	
AM 404	Design of Robot Arms	78	97	175	7.00	C	
AM 405	CAD/CAM	78	97	175	7.00	C	
AM 406	Systems Modeling and Simulation	63	112	175	7.00	C	

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