University of Mosul
College of Engineering

Guide of Department of Mechanical Engineering

2025 Edition

9 الصناعة والابتكار والبنية التحتية

Uomosul.edu.iq/engineering/ Iraq-Mosul-Al Majmoaa Street

Introduction

Mechanical Engineering at the University of Mosul is one of the first departments established in the College of Engineering. This guide gives an idea about the department, its buildings, laboratories, in addition to the scientific activities, events and community service it provides.

In addition to the Bachelor of Science in Mechanical Engineering awarded by the department, the Department of Civil Engineering offers postgraduate studies in the fields of thermal energy , applied mechanics , and metal production.

This guide is available in Arabic and English and this work has been prepared Under the direction of the Dean of the College of Engineering, Prof. Dr. Abdul Rahim Ibrahim Jassim, and under the ,supervision of the Head of the Department of Mechanical Engineering . Assistant Professor Dr. Omar Muhammad Hamdoun

2024-2025

Department Management

Ass.P.D. Omar Mohammed Hamdoun

- Head of Mechanical Engineering Department
- Thermal power engineering specialization

Lec. Qais Hazem Ismail

- Department decision
- Production and Metallurgical Engineering specialization

Department Laboratories

Air conditioning and refrigeration

- **Laboratory Manager: Asst. Prof. Dr. Omar Mohammed Hamdoun**

Mechanical Workshop

- **Laboratory Manager: A. L. Ahmed Nafeh**

Mechanical Workshop

- **Laboratory Manager: L . Ahmed Saadoun Abdel Aziz**

Metals

- **Laboratory Manager: L . Ahmed Saadoun Abdel Aziz**

Measurement lab

- **Laboratory Manager: Asst. Prof. Dr. Mohamed Naguib Abdullah**

Vibration lab

Laboratory Manager :L. Qais Hazem Ismail

Department Laboratories

Heat Transfer

- Laboratory Manager: L. Raed Ahmed Ali

Fluid lab

- Laboratory Manager: Asst. Prof. Dr. Taha Ahmed Abdullah

Computer Lab

- Laboratory Manager: A.L. Iman Mohammed Ali Suleiman

Control lab

- Laboratory Manager: A.L. Khaled Elias Hammou

Applied Mechanics Laboratory

- Laboratory Manager: L. Bakr Nouri

Sand

Laboratory Manager :Asst. Prof. Dr. Omar Dhnoon Juma

Vision:

The department seeks to be one of the leading departments in the field of mechanical engineering in Iraq and the region by graduating engineers specializing in mechanical engineering according to the latest approved scientific curricula and using the latest scientific teaching methods such as .laboratories and modern teaching methods

Mission:

Graduating competent engineers in various mechanical engineering specializations, which include the foundations of mechanical design, thermal capacity, various production methods, air conditioning and refrigeration, so that they have the ability to innovate and create in various engineering fields and keep pace with scientific development.

Providing practical and applied opportunities for students to learn about scientific engineering principles and facts and not just the theoretical aspect by establishing the latest laboratories and engineering workshops and equipping them with the latest types of laboratory equipment and supplies and organizing scientific trips to various sectors of the country.

Providing the best capabilities for students in order to build a leadership spirit in its graduates by teaching them distinguished teamwork, stimulating student efforts to participate and contribute to student work, and urging students to be creative and innovative to meet the community's needs for competent mechanical engineers.

Holding scientific seminars, conferences and training courses for members of all departments and members of institutions of various industrial sectors to familiarize them with the most prominent scientific and technological developments with the aim of enhancing the efficiency and capacity of engineering cadres working in all sectors of society.

Goals:

- **Preparing engineers in an integrated scientific and social manner developing their love for work and scientific research, the ability to think creatively and work collaboratively in a team, in addition to gaining experience in using modern technologies and their industrial applications.**
- **Preparing engineers to advance and participate in scientific research and studies in the department's field of specialization, especially those that aim to find solutions to various issues facing economic and social development.**
- **Communicating with the community and its institutions, providing engineering services, and opening up to the community, which encourages the public and private sectors to consolidate a good relationship with the university by providing consultations and holding specialized training courses in various fields of mechanical engineering according to the community's requirements.**

- **Communicating with reputable international universities and exchanging expertise and modern scientific information to develop theoretical aspects in addition to practical aspects and urging researchers to apply for international funding and grant projects.**

- **to support Committee Ethics Search Scientific and urging Researchers To apply For projects Financing And grants International.**

- **Starting from the academic year 2010-2011, the Department of Mechanical Engineering began trying to enhance the scientific status by entering the field of quality and reliability, which we are still working to obtain. It is worth noting that our laboratories have obtained the accuracy and calibration certificate for all engineering tests from the Central Agency for Standardization and Quality Control, which represents a basic building block for achieving our main goal, which is to obtain the quality and reliability witnessed by the twenty-first century.**

Criterion 1: Objectives of educational programs

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

Strategic Planning

Vision:

The Department of Mechanical Engineering at the University of Mosul seeks to be one of the leading departments in the field of engineering at the national and regional levels by graduating competent engineers in the field of mechanical engineering according to the latest approved scientific curricula and using the latest modern scientific and practical teaching methods such as laboratories and technical workshops

1-2 Statement of Program Educational Objectives (PEOs)

1.Graduating mechanical engineers who are highly qualified scientifically and ethically.

2.Building leadership qualities among graduates by teaching them leadership skills and solving. problems they face through teamwork, taking into consideration quality standards and professional work.

3.Instilling the spirit of acquiring knowledge among students and urging them to commit to serving the community.

4.Contributing research project ideas that serve the community and contribute to its development.

5.Sponsoring outstanding students and encouraging them to use their skills.

6.Guiding students and promoting the spirit of citizenship..

7.Providing a good work environment for students, faculty and staff, focusing on high academic, professional and ethical standards on campus, allowing freedom of opinion, respecting the opinions of others and encouraging the exchange of knowledge.

1-3 Consistency of the educational program objectives with the department's mission

(PEOs) Consistency with the Mission Statement

The objectives of the educational programs of the Department of Mechanical Engineering are well aligned with the mission of the department, and are closely linked through their integrated compatibility with the tasks of the department. The first objective of the educational program is to provide the first step towards the achievement mission. The knowledge background and skills necessary to achieve the first educational goal are acquired. Students gain a good education through several ways, including knowledge, skills and ethical values of the profession as stated in the contents of the first educational goal. The professional and ethical issues of the educational goals are also maintained in ensuring the qualities of self-development, professional growth and improving the performance of faculty members, technical and administrative staff. Some of the educational program objectives are closely related and compatible with the missions and groups of the University of Mosul and the College of Engineering. The sections of the first educational goals and other goals had a direct impact on presenting the missions of the university in general and the college in particular.

1-4 Constituencies Program

The components of the educational program are considered important and essential matters that lead to achieving an integrated and distinguished performance for the Mechanical Engineering

Department program, as its performance standard depends largely on the acceptance and satisfaction of the supervisors of the implementation of this program, and they are explained as follows:

A. Faculty: Faculty members of the College of Engineering participate regularly in evaluation processes. Faculty members are a cohesive group working as a team to improve the quality of education in the Department of Mechanical Engineering at the University of Mosul. They are committed to the educational program and continuously produce graduates who have a

significant impact on the wide applications of mechanical engineering. Faculty members share their expertise.

Accumulated as consultants outside the university in many public and private sectors. Faculty members also participate in preparing applied scientific research in the field of mechanical engineering.

B. Students : Students are interested in the educational programs of the Mechanical Engineering Department, which provide them with suitable opportunities for work in the future. The educational .

C. programs motivate students and prepare them based on the correct scientific foundations to become successful engineers who have an effective and influential role and are able to meet the requirements of the labor market and serve the community.

D. Graduates : This group consists of a number of recent graduates who have been employed for a maximum of two years and graduates who have been employed for 3 to 5 years. Graduates with 3 to 5 years of work experience are an essential part of the evaluation process. They should be motivated to evaluate the quality of educational program objectives based on their achievement of a number of professional achievements.

E. Employers : Employers' approval of the type and quality of education provided to students is a measure of the success of the educational program. This approval is then translated into providing employment opportunities for students after their graduation.

Achieving the educational program objectives: The objectives of educational programs remain fixed and are rarely changed. They are difficult to evaluate in terms of time and cost, as a complete evaluation of these objectives requires conducting surveys and opinion polls of graduates and employers. The evaluation process is ongoing and informal through many channels, such as employer and graduate surveys, student polls, faculty opinions, industry experts, etc.

Program Educational Objectives Review Process (PEOs) Review Process

The educational program objectives of the Department of Mechanical Engineering have been implemented in practice throughout its long history. The educational program objectives are set through the involvement of all components of the educational institution represented by the department, the college and then the university. The mission of the university and the college is to instill a solid foundation of mathematical, scientific and engineering knowledge in their graduates in addition to developing the intellectual skills essential for excellence in their professional lives.

These educational objectives have been discussed with all faculty members in many previous department meetings. The program of the Department of Mechanical Engineering in terms of the educational program and its objectives are well aligned with the mission of the department to provide high-quality education in the department. The first goal of the educational program objectives provides students with a solid foundation in the methodologies of the mechanical engineering specialization and design by focusing on the application of mathematical, scientific and engineering principles. It provides students with knowledge and professional ethics related to mechanical engineering, in addition to developing an awareness of the societal impact of mechanical engineering technologies.

The second objective of the educational program focuses on improving, developing and qualifying the teaching and administrative activities of the department. While the other objectives focus on developing and improving the capabilities and skills of faculty members and engineering, technical and administrative staff, the remaining objectives take into account the optimal use of the department's facilities and resources and improving and

qualifying these facilities. They are also linked to the department's participation and cooperation with local, Arab and scientific universities with high and advanced qualifications in order to improve and develop the programs of the Mechanical Engineering Department. These objectives also focus on the department's scientific research activities and how they can be directed to serve society, government and the state.

The process of reviewing the educational program objectives includes a continuous demonstration that these objectives are based on the needs of the various state institutions and departments. The special review process is conducted informally and continuously whenever possible, and these objectives are verified continuously through various evaluation tools. Evaluation data that has been previously collected from various sources is collected and analyzed, and corrective actions and improvements are implemented according to the specified criteria and as needed.

2: Criterion Graduate outcomes

The world today is witnessing major, rapid and comprehensive transformations in all areas of economic, social, cognitive, educational and political life, in which natural resources are no longer

the sole backbone of development. Rather, the knowledge economy, which relies primarily on human resources, has come to contribute as a main pillar in development and progress plans.

In light of this situation, higher education and scientific research institutions bear a major responsibility in finding the best strategies, programmes, and curricula and study plans to develop knowledge and skills and provide graduates with sufficient flexibility to enable them to keep pace with these changes and expected future changes, in a manner that is consistent with the needs of the labour market and development requirements.

Higher education is receiving increasing attention in all developed and developing societies alike as a strategic asset that meets the labor market with all its needs for human resources capable of developing plans and programs in various areas of life.

From here, an important issue emerges, which is the relationship between higher education institutions and the job market. It is a necessary reciprocal

relationship. The job market, with its constantly changing variables, needs the outputs of these institutions with their various academic specializations and diversity. They provide their graduates with the necessary scientific and practical skills, in line with the requirements of the job market. This always prompts higher education institutions to develop their various programs and specializations.

Achieving compatibility between higher education outcomes and labor market requirements is considered one of the most important challenges facing higher education institutions due to its impact on various aspects of economic and social life, and on achieving development goals. Failure to achieve this compatibility is a waste of human energies, a drain on resources, and a weak feasibility of investing in human development, the effects of which are reflected in comprehensive development.

The index of compatibility of higher education outcomes with labor market requirements indicates two types of compatibility levels: numerical compatibility and qualitative compatibility. If it is possible, even relatively, to perceive the level of numerical compatibility by following the development of both higher education outcomes and the positions created for this category annually, then the level of qualitative compatibility, which relates to the extent of compatibility between the qualifications of higher education graduates and the qualitative requirements of the job they are supposed to occupy, can only be perceived through special field studies. It is worth emphasizing here that numerical compatibility has no economic meaning unless it is supported by the goal of qualitative compatibility.

What are the "qualifications of university graduates "?

These are the characteristics, specifications and skills that students acquire during Their university studies and what the university expects from its graduates after completing their studies, and it is considered an important measure of its level of performance .

Graduates acquire these specifications through :

- Designing the academic programs offered by the university
- planning Interactive educational programs and their preparation
- Student assessment strategies Learning and teaching strategies in the university.
- Mechanisms for linking graduate specifications to programs and courses:
- Translating specifications into meaningful and relevant ideas. It includes the objectives for which the program was created (Specifying the outputs that must be achieved through the program).
- Identify the educational activities that achieve these outcomes (linking specifications) Graduates with educational activities).
- Identifying the strengths and weaknesses in the process of building graduate specifications At the level of interactive educational programs.
- Continuous improvement and renewal of academic plans to achieve specifications Graduates.

How will students know they have these qualifications.

Each interactive educational program description should include the following:

The objective (or objectives) of this program.

Educational and teaching activities that achieve these goals for students .

The criteria used to determine the extent to which educational and teaching activities achieve these objectives.

Each study program must also contain the three previous points.

Specifications of graduates of the Department of Mechanical Engineering at the University of Mosul:

- **He has extensive and comprehensive knowledge in his field of specialization.**
- **Able to rely on oneself .**
- **He has extensive research skills .**
- **He has the ability to design power stations and how to handle problems that may occur during operation.**
- **He can solve complex algebraic mathematical equations.**
- **Engineering drawing skills .**
- **Keeping pace with modern scientific and technical developments .**
- **He has the ability to take initiative and make decisions .**
- **He has the ability to talk to and convince others .**
- **He has the skill to communicate with others .**
- **He has sound scientific critical thinking .**
- **He has high self-confidence .**
- **Able to work within a team .**
- **Able to integrate into society .**
- **He respects the ethics of the profession to which he belongs .**
- **He respects and preserves the environment in which he lives .**
- **Belonging to the country and the university is respected and appreciated by him.**

Criterion 3: Curriculum

Academic Program Description:

The academic program in the Department of Mechanical Engineering is one of the most important pillars that the department pays great attention to due to its direct impact on the students registered in the department, as the department believes that the academic program is the main guarantee for building a successful mechanical engineer capable of facing the challenges he faces in his professional life. Building a successful engineer requires an integrated plan and a comprehensive program of scientific courses that students progress through successively based on the levels and type of the course, and this is what the academic program in the department includes. The department provides a guide to the academic program description which contains all approved curricula based on the course system that are taught for undergraduate and graduate studies.

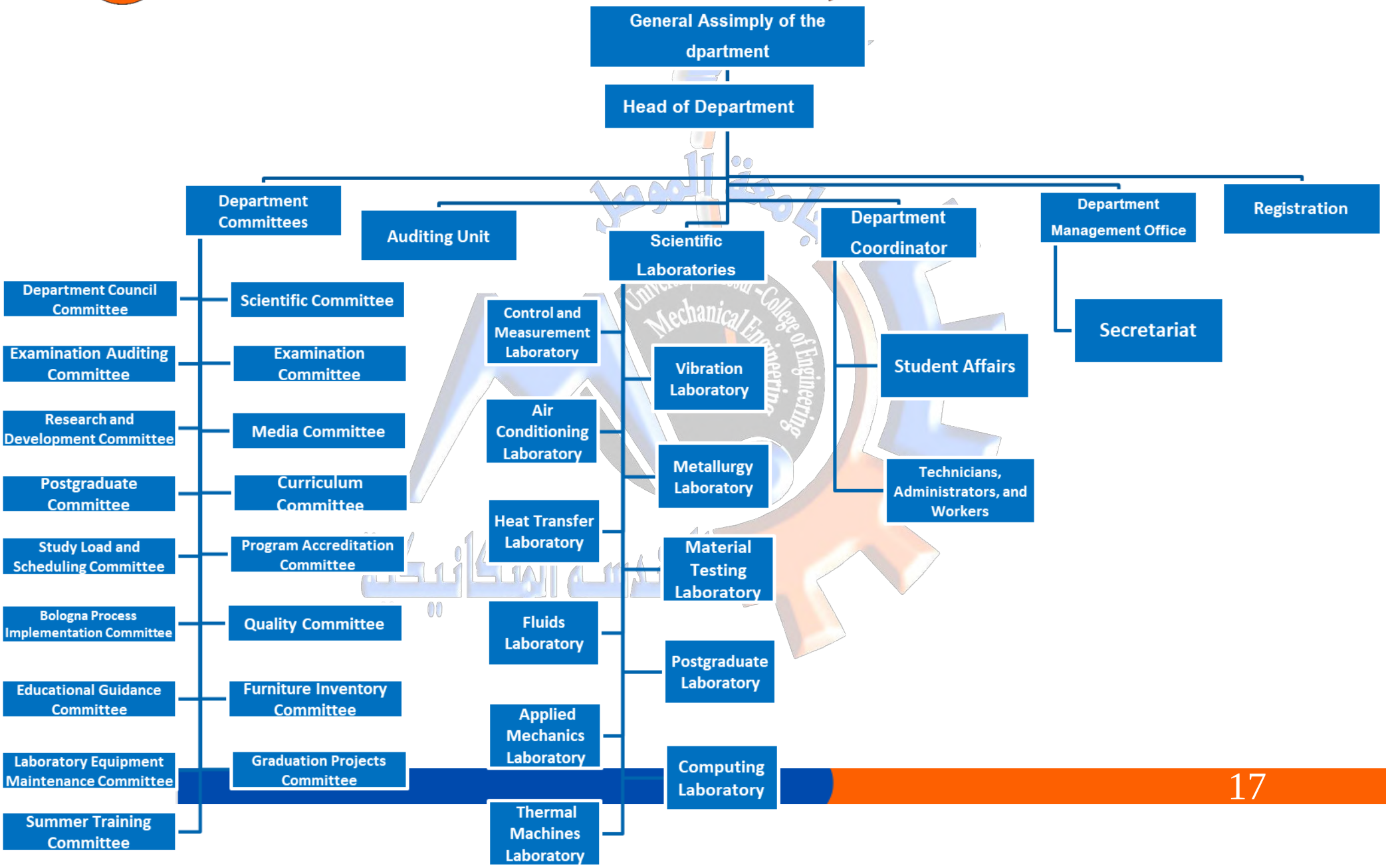
This guide is updated annually, adhering to the update rate specified by the Ministry of Higher Education and Scientific Research, which does not exceed 20%. This guide is available on the website of the College of Engineering, where the university provides the necessary resources from Curriculum books to ensure the success of the teaching process according to the specified curriculum The curricula are also followed up and completed according to special forms approved for this purpose. These forms

are requested at the end of each academic year to be analyzed, studied, and the most important problems and obstacle diagnosed to avoid them in the following academic year.

The percentages of these courses are as follows:

University courses: %11-15%

College courses: 16%-22%


General Assimply of the dpartment
Head of Department
Department Committees
Auditing Unit
Scientific Laboratories
Department Coordinator
Department Management Office
Registration
Department Council Committee
Scientific Committee
Examination Auditing Committee
Examination Committee
Research and Development Committee
Media Committee
Postgraduate Committee
Curriculum Committee
Study Load and Scheduling Committee
Program Accreditation Committee
Bologna Process Implementation Committee
Quality Committee
Educational Guidance Committee
Furniture Inventory Committee
Laboratory Equipment Maintenance Committee
Graduation Projects Committee
Summer Training Committee
Control and Measurement Laboratory
Vibration Laboratory
Air Conditioning Laboratory
Metallurgy Laboratory
Heat Transfer Laboratory
Material Testing Laboratory
Fluids Laboratory
Postgraduate Laboratory
Applied Mechanics Laboratory
Computing Laboratory
Thermal Machines Laboratory
Student Affairs
Technicians, Administrators, and Workers
Secretariat

Responsibilities

Head of Department: Managing the department in scientific, administrative, cultural, educational, financial, and students' affairs. Supervised on educational techniques and process, prepare a seasonally and annually reports on departments activities and raise it to the dean of the college. Distributing the duties on the department faculty and staff and issued administrative orders to do so.

Department Decision: Distributing and organizing the classes on the faculty members, follow up the student absence and the seminars.

Department Council Committee: Supervision on the department education program. Follow up and achieve the scientific plan and the development of faculty and staff.

Scientific Sobriety Committee: The Scientific Sobriety Committee is considered one of the most important committees in the department. The committee tasks include directing researchers and teaching staff in the department for publishing and how to choose research titles and scientific journals while publishing research, auditing the transactions of journals, their sobriety and their presence within the sober international repositories, and staying away from publishing in disreputable or counterfeit and commercial journals, in addition to Auditing the scientific content of journals and conferences.

Examination Committee: Follow up the mid-term and final exams, organize the observation schedule and observers. Receiving the exam questions and the grades from the faulty and organizing them securely. Prepare statistics to the final grades and provides the pass and fail percentages for examiners, preparing make-up exams.

Checking Committee: It works simultaneously with the examination committee during exams and results. The committee members check the marks received from the faculty.

Graduation Projects Committee: Collecting the suggested projects prepared by the faculty, organize them and present them to students. Preparing committee for discussing the projects after the students have completed their projects.

Continuous Education and Seminars Committee: Following up the continuous education session prepared and presented by department faculty for engineering who are working industrials. Additionally, following up the conferences and seminars prepared by the department.

Summer Training Committee: Prepare official letter specifically for junior students to admit them to be trained at the industrials. monitoring the students during training. Receiving reports prepared by students after they completed their training.

Media Committee: The committee members report all scientific and social activities via that the department make them frequently. They are usually done via photos and posters.

Books Distribution Committee: Distributing books to students at the beginning of each academic year and receive them at the end of the academic year. Organizing a list for borrowed books by faculty and graduate students.

Classes Schedule Committee: The committee members prepare classes schedule for undergraduate and post graduate programs.

Archiving Committee: Archiving masters theses and doctorial dissertations electronically for all area of concentrations under civil engineering major. Additionally, archiving the high diploma and final level projects electronically.

Inventory Committee: An inventory for the furniture and equipment available at the department rooms and laboratories

Social Solidarity Committee: Following up the social cases for the department students and staff who needs financial support.

Registration Committee: Receiving and registering new students at the beginning of each new academic year. Registering students for all academic levels and following up student statuses during academic year such as transferring, hosting, postponing, etc. Preparing students lists for all academic levels according to the classrooms.

Department Management: Reporting incoming official letters, sending out the official letter released from the head of department. Issued the official letters, and organization of issued and received official letters.

Printer: Typing, Printing, and reporting the official letter and reporting the student's daily attendance. Prepare a monthly table for the percent of student absence. Receiving and sending emails from and to the department management.

Library: Receive master thesis and doctorial dissertations electronically and hardcopies for graduated students who graduated recently Organize the work for borrowing books and theses and dissertations. Additionally, organize the Engineering software's CDs.

Teaching Staff

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Department Building

The Department of Mechanical Engineering is one of the departments of the Faculty of Engineering. The department was established in 1967 and accepts students who graduated from preparatory studies / scientific branch. The study period in the department is four years, during which the student obtains a Bachelor's degree in Mechanical Engineering. In 1970, the study period was amended to five years, then the study period returned to four years after 1974 and continues until now.

The department started postgraduate studies in the academic year 1976- to grant a higher diploma followed by a master's degree. In the 1977 academic year 1992-1993, doctoral studies were introduced in the branches of air conditioning and refrigeration engineering and thermal power engineering. After that, other specializations were opened, namely applied mechanics, production engineering, and metallurgy. The duration of study for a master's degree is currently two calendar years, while for a doctorate it is three calendar years. In both studies, there is a preparatory academic year followed by a comprehensive examination for doctoral students and then the research.

In the academic year 1995-1996, three branches were established in the department starting from the third stage. These branches are General Mechanics, Energy Engineering and Thermal Systems, and Production and Metallurgical Engineering. In the academic year 2008-2009, the three branches were merged into one branch (General Mechanics). A study was prepared to establish a special department for Production and Metallurgical Engineering.

The Department of Mechanical Engineering aims to prepare engineers with technical and scientific qualifications to serve industrial and scientific institutions and participate in solving community problems in their field of specialization and participate in all events and activities that support the scientific process in a way that drives it towards continuous modernization and development, and communicate and interact with other universities and scientific institutions in the fields of research, cooperation and exchange of experiences and information, in addition to coordination with the private sector through the engineering consulting office and the mechanism of cooperation with state institutions and assisting it with providing the scientific advice required to develop and improve work performance.

Mechanical engineering is a branch of engineering that deals with the designmanufacture, operation, and development of machines or devices used in various sectors of economic activity. According to the Encyclopedia Britannica mechanical engineering is a branch of engineering that deals with the design, manufacture, installation, and operation of engines, machines, and .manufacturing processes. It is particularly concerned with forces and motion It is a science that studies energy in all its forms and its effect on bodies. It is a broad specialization related to all areas of life. For example, mechanical engineering is related to the space and aviation industries, production and energy conversion, building mechanics, transportation and technology. Air conditioning Cooling and modeling And computer simulation.

The invention The steam engine in the latter part of the eighteenth century provided a key source of power for the Industrial Revolution and a major impetus for the development of machinery in all its forms. As a result, an important new branch of engineering developed, dealing with advanced tools and machines, and received official recognition in 1847 with the foundation of the Institution of Mechanical Engineers in Birmingham.

Mechanical engineering emerged as a result of practice and trial and error by specialized engineers and scientific methods in research, design and productionThe constant demand for efficiency has been the reason for the ,increasing increase in the quality of work required of the mechanical engineer which requires a high degree of learning and skill.

Mechanical engineering degrees are awarded by many universities around the world. The mechanical engineering study system usually lasts four to five years ,and at the end of the study a Bachelor of Science, Bachelor of Technology Bachelor of Engineering, or Bachelor of Applied Engineering is awarded.

Mechanical engineering studies the following sciences:

Kinematics, . Statics, Mechanics of materials, Engineering measuring tools,. Heat transferFluid mechanics, Thermodynamics, Compressed gas technology, Heating, ventilation and air conditioning, . Mechatronics, Control theory, Manufacturing technology Computer aided design.

Mechanics (engines and vehicles) Machines: It is concerned with studying the theory of machines and the methods of connecting mechanical parts and components together to move with a specific mechanism. It is also concerned with studying motion gears and the relationships of gears connected together and their types.

Mechanical design, Computer aided manufacturing.

A mechanical engineer should be aware of and able to deal with the basic rules of chemistry. And electricity And engineering physics , and most mechanical engineering studies contain the study of mathematics Advanced mathematics, especially differential equations. And partial.

Details of the Mechanical Engineering Department building

Sequence	Office type	Area m^2	Number
1	Section area	6*7	1
2	Secretary's room	3*5	1
3	Departmental Courses Hall	5 × 3	1
4	Department archive room	2*3	1
5	Classrooms	2*3	30
6	Examination committee hall	6*7	1

Details of the Mechanical Engineering Department building

Floor name	Hall name	Hall area m^2	Hall capacity students	Current hall coding	New Hall Coding
My land	Main discussion hall	10*12	50 students	016	230001
First floor	Fourth A	4*7	42	102	230101
	Fourthly b	4*7	42	103	230102
	Thirdly A	4*7	42	104	230103
	Thirdly b	4*7	42	109	230104
	Secondly b	7*4	42	110	230105
	Secondly a	7*4	42	111	230106
	Graduate Discussion Room	7*4	42	121	230107
	Dr. Burhan Al-Aili Hall	7*4	42	E120	230108
	Drawing room1	7*4	42	E112	230109
Second floor	Graduate Hall1	6*7	30	201	230201
	Graduate Hall2	5*7	30	202	230202
	Graduate Hall3	5*7	30	203	230203
	First C	5*7	30	209	230204
	First B	5*7	30	210	230205
	Firstly	5*7	30	211	230206
	Drawing room2	12*10	50	E203	230207

Department Laboratories

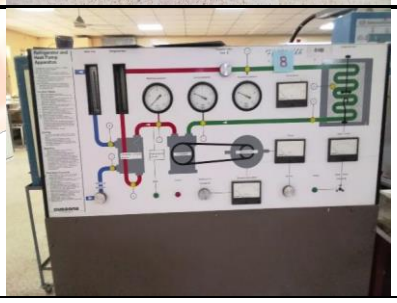
The Department of Mechanical Engineering has many laboratories that are distinguished by their scientific and advisory activities. These laboratories contain a large number of devices that are subject to permanent maintenance

These laboratories contribute to performing many experiments for the undergraduate levels and in completing postgraduate research. They also contribute to supporting the scientific research movement of professors, in addition to the laboratories' contribution to conducting many laboratory tests in cooperation with many government departments through the cooperation mechanism and the consulting office. A number of lecturers supervise the laboratories, who are distinguished by their efficiency and scientific experience.

1- Air conditioning and Refrigeration

The lab's work is summarized in conducting experiments on the subject of air conditioning and refrigeration for fourth-year students, project students, and postgraduate students.

Apparatuses Description of Devices and Equipment

Device Name	Device Description	Device image	Device Image
1	General icing circle	A device used to give practical experiments on the subject of refrigeration. The device depends on electrical energy to operate.	
2	Training for refrigerators	A device used to give practical experiments on the subject of cooling in the electric refrigerator unit. The device depends on electrical energy.	
3	Air Conditioning Study Unit	A device used to give practical experiments on the subject of air conditioning . The device depends on the compressor working to push the gas with electrical energy	
4	Heat Pump Study Unit	A device used to give practical experiments on the subject of refrigeration and heat pumps. The device depends on electrical energy.	

Apparatuses Description of Devices and Equipment

Device Name	Device Description	Device image	Device Image
5	Computerized Air Conditioning Trainer	A device used to provide practical experiments on the subject of air conditioning and the device is controlled by a computer using specific operating programs.	

2-Thermal Machinery Laboratory

The laboratory work is summarized in conducting various experiments on the subject of internal combustion engines (petroleum and diesel) for the ,department's students and on topics related to these engines. In addition the project students in the fourth stage as well as the graduate students benefited from the laboratory equipment and conducted their research experiments on it,

Apparatuses Description of Devices and Equipment

No.	Device Name	Device Description	Device image
1	2 stroke gasoline spark plug engine	A device used to conduct experiments on two-stroke gasoline engines and is considered a mechanical device.	
2	4 stroke diesel engine	A device used to give experiments on four-stroke diesel engines and is considered a mechanical device.	

Names of experiments

Study the effect of engine speed on the performance and emissions of the spark-ignition engine.

Study the effect of engine speed on the performance and emissions of the self-ignition combustion engine.

Apparatuses Description of Devices and Equipment

No.	Device Name	Device Description	Device image
3	Four stroke variable compression ratio engine	A device used to give experiments on four-stroke gasoline engines and is considered a mechanical device.	
4	Four-stroke gasoline engine with variable compression ratio	A device used to give experiments in four-stroke gasoline engines with a change in the compression ratio. It is considered a mechanical device.	
5	Single cylinder engine inspection model	A device used to give experiments in machines consisting of one cylinder and is considered a mechanical device.	

3-Metallurgical Laboratory

Lab objective

The laboratory's work is summarized in conducting metallographic examination of metals, conducting experiments for the first, second and 'third stages, as well as for graduation projects and postgraduate students research, in addition to .Engineering consulting.

Apparatuses Description of Devices and Equipment

No.	Device Name	Device Description	Device image
1	Indian origin light microscopes	Used to examine the microscopic structure of alloys.	
2	Hand press	Used to press specimens prepared for microscopic examination.	

Apparatuses Description of Devices and Equipment

No.	Device Name	Device Description	Device image
3	Electronic scale	Used to weigh light materials less than 350 grams in three decimal places.	
4	dried samples	Used to dry samples during preparation for microscopic examination.	
5	Metal polishing machine	Used to polish specimens during preparation for microscopic examination.	

Apparatuses Description of Devices and Equipment

No.	Device Name	Device Description	Device image
6	cylindrical heating furnace	It is used to heat metal models up to 1200°C and is used in heat treatments of metals.	
7	Ultrasonic vibration device	It is used to examine internal defects in steel using ultrasound.	

No.	Device Name	Device Description	Quantity	Device Picture
1	General icing circle	A device used to give practical experiments on the subject of refrigeration. The device depends on electrical energy to operate.	1	
2	Training for refrigerators	A device used to give practical experiments on the subject of cooling in the electric refrigerator unit. The device depends on electrical energy.	1	
3	Air Conditioning Study Unit	A device used to give practical experiments on the subject of air conditioning . The device depends on the compressor working to push the gas with electrical energy .	1	

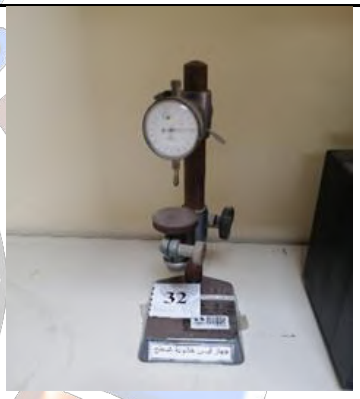
4-Measurements Laboratory

Lab objective: The laboratory work consists of conducting experiments on measuring tools as a practical activity that follows the manufacturing methods course, i.e. it completes the workshop sections for first-year students

Apparatuses Description of Devices and Equipment

No.	Device Name	Device Description	Quantity	Device Picture
1	German electrometer	It is used to measure dimensions with an accuracy of up to 0.001 mm.	1	
2	Deflection measuring device	Used to measure the deviations of mechanically operated models in workshops.	1	
3	Surface roughness tester	Used to measure the surface roughness of mechanically processed models in workshops.	1	
4	Digital and mechanical vernier	It is used to measure the dimensions of mechanically operated models in workshops.	1	

Apparatuses Description of Devices and Equipment

No.	Device Name	Device Description	Quantity	Device Picture
5	Micrometers of various sizes	Used to measure external and internal dimensions and depths of models.	1	
6	Surface roughness meter	mechanical device used to measure the surface roughness of mechanically processed models in workshops.	1	

Names of experiments:

1- Verniers

2-Types of micrometers

3- Gauge blocks

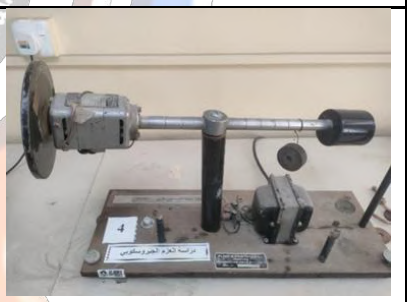
5- Applied Mechanics Laboratory

The laboratory's work is summarized in conducting experiments in the subject of dynamics and mechanics of machines for second and third year students, project students, and postgraduate students.

Apparatuses Description of Devices and Equipment

No.	Device Name	Device Description	Quantity	Device Picture
1	Sill and column loading device	A mechanical device used to conduct experiments to study the behavior of beams and columns towards the applied load.	1	
2	Flying wheel model	A mechanical device used to conduct practical experiments in the subject of applied mechanics.	1	
3	Rope belt friction	A mechanical device used to conduct experiments to study the behavior of beams and columns towards the applied load.		
4	Astronomical gear study device	An electrical device used to conduct experiments to study and evaluate astronomical gears	1	

Apparatuses Description of Devices and Equipment

No.	Device Name	Device Description	Quantity	Device Picture
5	Governor speed controller	A mechanical device used to conduct experiments to study and measure acceleration and its components.	1	
6	Governor speed controller	An electro-mechanical device used to conduct experiments using different speeds.	1	
7	Gyroscopic effect	An electro-mechanical device used to conduct experiments and calculate gyroscopic torque.	1	
8	Pressure gauge calibration device	A mechanical device used to conduct experiments on the calibration of pressure gauges.	1	

Names of experiments:

1-Universal beam

2-Fly wheel

3-Rope belt friction

4-Strut loading

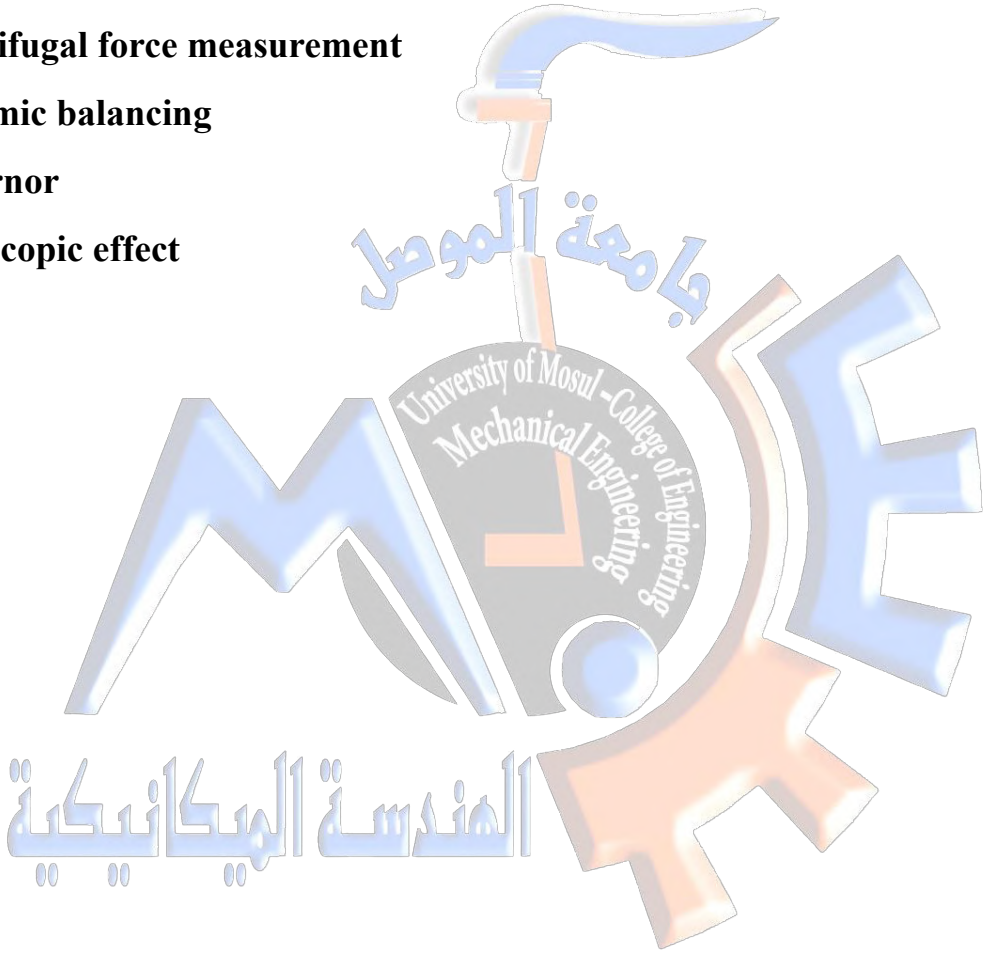
5-Slipping friction

6-Centrifugal force measurement

7-Dynamic balancing

8-Governor

9-Gyroscopic effect

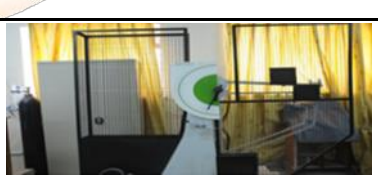


6- Materials Testing Laboratory

Lab objective:

The laboratory specializes in conducting mechanical tests as well as thermal treatments of metals by conducting experiments for students in the second third and fourth years, as well as for graduation projects, postgraduate research and engineering consultations.

Main laboratory equipment

No.	Device Name	Device Description	Quantity	Device Picture
1	tensile testing device	Used to perform tensile testing using hydraulic pressure.	1	
2	Computerized tensile testing device	An electrical device used to perform a computer-controlled tensile test.	1	
3	Hardness tester	Used to test the Rockwell hardness of metals.	1	
4	Izod shock absorber	Used to measure the shock resistance of metals.	1	

Apparatuses Description of Devices and Equipment

No.	Device Name	Device Description	Quantity	Device Picture
5	garby shock tester	Used to measure the shock resistance of metals.	1	
6	Metal Analyzer	Used to analyze the proportions of components in steel.	1	
7	Metal polishing machine	Used to refine specimens prepared for chemical analysis.	1	

Names of experiments:

1- **Hardness test**

2- **Tensile test**

3- **Impact test**

4- **Hardenability test**

5- **Strain hardening exponent**

6- **Anisotropic plasticity ratio**

8-Sand Laboratory

The sand laboratory

1-The student obtains a high standard level of basic scientific knowledge.

2- Building scientific expertise according to a practical, applied approach that opens up horizons of creativity for them.

3- Motivating the student to innovate and use solid scientific application methods.

Nominating the student's scientific thinking and self-education process to raise his scientific abilities by implementing his basic and applied information through implementing and discussing scientific experiments within this specialization.

Main Laboratory Equipment

No.	Device Name	Device Description	Quantity	Device Picture
1	pulp drying oven	Used to dry the pulp used for the molding process.	1	
2	Sand volume measuring device	A device used to measure and isolate the sizes of sand used for casting molds.	1	
3	Sand erosion meter	Used to compact sand used in plumbing	1	
4	Multipurpose machine	Used to compact sand used in plumbing	1	
5	Humidity meter	A device used to measure the moisture content of sand.	1	
6	Single pan slide balance	A device used to measure the weight of sand.	1	

No.	Device Name	Device Description	Quantity	Device Picture
7	Sand making machine	A device used to crush sand particles.	1	
8	Masstronic balance	A device used to measure and compact fine sand.	1	

Names of experiments:

1-Determine the percentage of silt (clay).

2-Determine the moisture content of the sand.

3-Determine the size of sand grains

4-Determining the percentage of sand extinction .

8- Fluid Laboratory

The lab's work is summarized in conducting experiments in fluids for second and third year students, project students, and postgraduate students.

Main laboratory equipment:

No.	Device Name	Device Description	Quantity	Device Picture
1	Oil and water pumps inspection	An electrical device used to conduct experiments on oil pumps and water pumps.	1	
2	flow clarification device	An electrical device used to conduct fluid flow experiments.	1	
3	Water turbine	An electrical device used to conduct water turbine experiments	1	

Names of experiments:

1- Checking oil and water pumps.

2-Flow clarification device.

3- Water turbine.

9- Computer Laboratery

The laboratory

The computer lab is used by the department's students, where students are introduced to the components of the computer and its mechanism of operation, and their skills in using the computer and some programming languages are developed, and their scientific material is refined and focused on the practical aspect. In this lab, computational programs related to

computer operating systems and programs related to designs and engineering drawing are run via the computer. The lab teaches numerical and engineering analytics programs ,Mat Lab, AutoCAD, andMicrosoft Office.

Main laboratory equipment

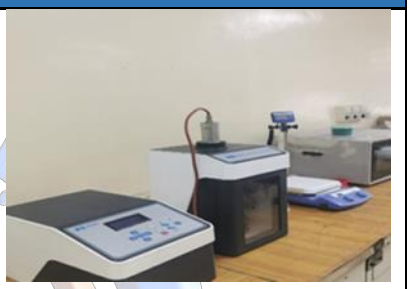
No.	Device Name	Device Description	Quantity	Device Picture
1	Desktop Calculator(25)	(Desktop calculator) used to teach engineering software to students in the subject of programming as well as mechanical drawing.	25	
2	Laptops(30)	(Desktop calculator) used to teach engineering software to students in the subject of programming as well as mechanical drawing.	30	
3	Prepare a presentation (1)	Computer lab accessories for lecture presentation	1	

The names of the experiences:

1-Computer Aided Mechanical Drawing Program/Stage Two-First.

2- Computer, operating system andMicrosoft office program / for the first stage. / First semester.

10- Graduate Research Laboratory

No.	Device Name	Device Description	Quantity	Device Picture
1	Ultrasonic mixer	It is used to mix powders and uses the principle of ultrasonic waves in its operation.	1	
2	Magnetic mixer	An electrical device used to mix powders using the principle of magnetism in its operation.	1	

University of Mosul / College of Engineering / Department of Mechanical Engineering
2025-2024 Course Catalog /First and Second Stages / Polonia System

Republic of Iraq - Ministry of Higher Education and Scientific Research

University of Mosul

Bachelor's degree in Mechanical Engineering (First cycle)

Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25hr

Program Curriculum (2024 - 2025)

جمهورية العراق - وزارة التعليم العالي والبحث العلمي

جامعة الموصل

بكالوريوس في الهندسة الميكانيكية (الدورة الأولى)

أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة اوربية - كل وحدة اوربية = ٢٥ ساعة

المنهاج الدراسي للعام ٢٠٢٤-٢٠٢٥

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGI	One	1	ME101	Engineering Mechanics-Statics I	الميكانيك الهندسي - السكون ا	English	2	1			1		3	63	37	100	4.00	C	
		2	ME102	Mathematics I	الرياضيات ا	English	2	1			1		3	63	37	100	4.00	B	
		3	ME103	Manufacturing Processes I	عمليات التصنيع ا	English	2	1		3			3	93	57	150	6.00	C	
		4	ME104	Engineering Drawing	الرسم الهندسي	English	1		2	3			3	93	57	150	6.00	B	
		5	ME105	Physics for Engineers	الفيزياء للمهندسين	English	2	1			1		3	63	62	125	5.00	B	
		6	ME106	Computer	الحاسوب	English	2		1				3	48	27	75	3.00	S	
		7	ME107	Arabic Language	اللغة العربية	Arabic	2						3	33	17	50	2.00	S	
						Total	13	4	3	6	3	0	21	456	294	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
	Two	1	ME151	Engineering Mechanics-Statics II	الميكانيك الهندسي - السكون II	English	2	1			1		3	63	37	100	4.00	C	
		2	ME152	Mathematics II	الرياضيات II	English	2	1			1		3	63	37	100	4.00	B	
		3	ME153	Physical Metallurgy	فيزياء المعادن	English	2	1		2			3	78	72	150	6.00	C	
		4	ME154	Introduction to Electrical Engineering	مقدمة في الهندسة الكهربائية	English	2	1		2			3	78	72	150	6.00	B	
		5	ME155	Energy & Sustainability	الطاقة والاستدامة	English	2	1			1		3	63	87	150	6.00	B	
		6	ME156	English Language I	اللغة الإنكليزية ا	English	2						3	33	17	50	2.00	B	
		7	ME157	Democracy and Human Rights	الديمقراطية وحقوق الانسان	English	2						3	33	17	50	2.00	S	
						Total	13	4	0	7	3	0	24	411	339	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	hr/sem	hr/sem	hr/sem	hr/sem			
UGII	Three	1	ME201	Engineering Mechanics-Dynamics	الميكانيك الهندسي - الحركة	English	3	1			1		3	78	97	175	7.00	C	
		2	ME202	Fluid Mechanics I	ميكانيك الموائع I	English	2	1			1		3	63	37	100	4.00	C	
		3	ME203	Thermodynamics I	ديناميك الحرارة I	English	2	1			1		3	63	37	100	4.00	C	
		4	ME204	Mechanics of Materials I	ميكانيك المواد I	English	2	1			1		3	63	37	100	4.00	C	
		5	ME205	Metallurgy	المعادن	English	2			2			3	63	62	125	5.00	C	
		6	ME206	Mechanical Drawing	الرسم الميكانيكي	English				3			3	48	52	100	4.00	C	
		7	ME207	Crimes of the defunct Ba'ath party	جرائم حزب البعث البائد	Arabic	2						3	33	17	50	2.00	S	
						Total	11	4	0	5	4	0	18	411	339	700	30.00		

UGII	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	hr/sem	hr/sem	hr/sem	hr/sem			
	Four	1	ME251	Fluid Mechanics II	ميكانيك الموائع II	English	2	1			1		3	63	37	100	4.00	C	
		2	ME252	Thermodynamics II	ديناميك الحرارة II	English	2	1			1		3	63	37	100	4.00	C	
		3	ME253	Mechanics of Materials II	ميكانيك المواد II	English	2	1			1		3	63	37	100	4.00	C	
		4	ME254	Engineering Mathematics	الرياضيات الهندسية	English	4	1			1		3	93	107	200	8.00	C	ME152
		5	ME255	Computer Aid Engineering Applications	تطبيقات هندسية بمساعدة الحاسوب	English	1	1		3				75	50	125	5.00	C	
		6	ME256	Mechanical Engineering Laboratory I	مختبرات الهندسة الميكانيكية I	English				3				45	30	75	3.00	B	
		7	ME257	English Language II	اللغة الإنكليزية II	English	2						3	33	17	50	2.00	S	
						Total	13	5	0	6	4	0	15	435	315	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
UGIII	Five	1	ME301	Theory of Machines	نظريات المكائن	English	4	1			1		3	93	82	175	7.00	C	
		2	ME302	Conductive Heat Transfer	انتقال الحرارة بالتوصيل	English	2				1		3	48	52	100	4.00	C	
		3	ME303	Manufacturing Processes II	عمليات التصنيع II	English	2			3			3	78	72	150	6.00	C	ME103
		4	ME304	Combustion and Pollution	الاحتراق والتلوث	English	2				1		3	48	52	100	4.00	C	
		5	ME305	Gas Dynamics	ديناميك الغازات	English	2				1		3	48	52	100	4.00	C	
		6	ME306	Non-Destructive Testing	الاختبارات اللاتلافية	English	2						3	33	42	75	3.00	C	
		7	ME307	English Language III	اللغة الإنكليزية III	English	2						3	33	17	50	2.00	S	
						Total	16	1	0	3	4	0	21	381	369	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)							
	Six	1	ME351	Machine Element Design	تصميم أجزاء المكائن	English	4	1	1		1		3	108	92	200	8.00	C	
		2	ME352	Convective and Radiative Heat Transfer	انتقال الحرارة بالحمل والاشعاع	English	2				1		3	48	52	100	4.00	C	
		3	ME353	Engineering & Numerical Analyses	تحليلات هندسية وعددية	English	2		2		1		3	78	72	150	6.00	B	ME254
		4	ME354	Engineering Management and Economics	الإدارة الهندسية والاقتصاد	English	2		2				3	63	37	100	4.00	B	
		5	ME355	Internal Combustion Engines	مكائن الاحتراق الداخلي	English	2				1		3	48	52	100	4.00	C	
		6	ME356	Mechanical Engineering Laboratory II	مختبرات الهندسة الميكانيكية II	English	2				1		3	48	52	100	4.00	C	
						Total	14	1	5	0	5	0	18	393	357	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w) CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
UGIV	Seven	1	ME401	Design of Machines System	تصميم منظومات المكائن	English	4	1	1		1		3	108	67	175	7.00	C	
		2	ME402	Air-conditioning and Refrigeration	التكييف والتثليج	English	4	1	1		1		3	108	67	175	7.00	C	
		3	ME403	Control and measurements	السيطرة والقياسات	English	2	1			1		3	63	87	150	6.00	C	
		4	ME404	Turbomachinery	المكائن التوربينية	English	2	1			1		3	63	37	100	4.00	C	
		5	ME405	Power Plant	محطات قدرة	English	2	1					3	48	52	100	4.00	C	ME252
		6	ME406	Engineering Project I	مشروع التخرج I	English	2						3	33	17	50	2.00	C	
						Total	16	5	2	0	4	0	18	423	327	750	30.0		
UGIV	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w) CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
	Eight	1	ME451	Engineering Materials	المواد الهندسية	English	4	1			1		3	93	82	175	7.00	C	
		2	ME452	Mechanical Vibration	الاهتزازات الميكانيكية	English	4	1			1		3	93	82	175	7.00	C	
		3	ME453	Renewable Energy	طاقات متجددة	English	2	1			1		3	63	37	100	4.00	C	
		4	ME454	Electric Machines	مكائن كهربائية	English	2			2			3	63	62	125	5.00	C	ME154
		5	ME455	Mechanical Engineering Laboratory III	مختبرات الهندسة الميكانيكية III	English				3			3	48	27	75	3.00	C	
		6	ME456	Engineering Project II	مشروع التخرج II	English	2						3	33	17	50	2.00	C	ME406
		7	ME457	English Language IV	اللغة الإنكليزية IV	English	2						3	33	17	50	2.00	S	
							16	3	0	5	3	0	21	426	324	750	30.0		
						Total	113	30	10	30	30	0	156	3336	2664	5950	240.0		Must be 240 ECTS

Note: The student should complete 4 weeks of Summer Internships to fullfil the requirements of the Bachelor's degree

Structured SWL (hr/w) type		
	CL	Class Lecture
	Lab	Laboratory
	Pr	Practical Training
	Tut	Tutorial
	Lect	Online lecture
	Semn	Seminar

Module type		
	B	Basic learning activities
	C	Core learning activity
	S	Suport or related learning activity
	E	Elective learning activity

SWL:	Student Workload
SSWL:	Structured SWL
USSWL:	Unstructured SWL

Note: Columns O, Q and R are progrmaed, protected and should not be edited

University of Mosul – College of Engineering – Mechanical Engineering Department
Curriculum / Courses/ First level/ Academic Year 2024–2025

First Academic Level (First Semester)								
Observations	Course Code	Smoother, if any	Number of Units	Number of practical hours	Number of theoretical hours	Course Name	Requirement Type (Compulsory – Optional)	Requirement Name
In English								
	UOMC100		3	0	3	Arabic Language	Compulsory	University Requirements
	ENGC121		3	0	3	Calculus I	Compulsory	College Requirements
	ENGC123		1	3	0	Engineering Drawing		
Compulsory for mechanical department	ENGE133		2	0	2	Physics	elective	
	MEC102		3	3	2	Manufacturing Processes I	Compulsory	Department Requirements
	MEC104		3	0	3	Introduction to Electrical Engineering		
	MEC101		3	0	3	Engineering Mechanics-Statics I		
	MEC103		2	3	1	Computer Programming I		
			19	9	17	Total hours and units of the first semester		

University of Mosul – College of Engineering – Mechanical Engineering Department
Curriculum / Courses/ First level/ Academic Year 2024–2025

First Academic Level (Second Semester)								
Observations	Course Code	Smoother, if any	Number of Units	Number of practical hours	Number of theoretical hours	Course Name	Requirement Type (Compulsory – Optional)	Requirement Name
						In English		
	UOMC101		3	0	3	English for Beginner	Compulsory	University Requirements
	UOMC102		3	2	2	Computer		
	UOMC103		2	0	2	Human Rights and Freedom		
The student chooses two units from the university's elective courses			2	0	2		elective	
				0	2			
				0	2			
				0	2			
	ENGC122	Calculus I	3	2	2	Calculus II	Compulsory	College Requirements
	ENGC124	Engineering Drawing	1	3	0	Computer Aided Drawing		
	MEC151	Engineering Mechanics-Statics I	2	0	3	Engineering Mechanics-Statics II	Compulsory	Department Requirements
	MEC152	Manufacturing Processes I	3	2	2	Metallurgy Physics I		
	MEC153	Computer Programming I	2	3	1	Computer Programming II		
			21	**12**	**16**	**Total hours and units of the second semester**		

University of Mosul – College of Engineering – Mechanical Engineering Department
Curriculum / Courses/ Second level/ Academic Year 2024–2025

Second Academic Level (First Semester)									
Observations	Course Code	Smoother, if any	Number of Units	Number of practical	Number of theoretical	Course Name		Requirement Type (Compulsory – Optional)	Requirement Name
						In English			
Three units in the first level and one unit in the second level			1	0	1	English Language-Pre Intermediate	English - Pre-Intermediate	Compulsory	University Requirements
Compulsory for students of the Department of Mechanics	ENGE228	Math 2	3	0	3	Engineering Math I	Engineering Mathematics 1	elective	College Requirements
	MEC201	physics	3	0	3	Thermodynamics I	Thermodynamics 1	Compulsory	Department Requirements
	MEC202	Engineering Mechanics-Static 2	3	0	3	Mechanics of Materials I	Mechanics of Materials 1	Compulsory	
	MEC203	physics	3	0	3	Fluid Mechanics I	Fluid Mechanics 1	Compulsory	
	MEC204	Computer Aided Drawing	1	3	0	Mechanical Drawing	Mechanical Drawing	Compulsory	
	MEC205	physics	3	0	3	Physics for Engineers	Physics for Engineers	Compulsory	
	MEC206	Engineering Mechanics-Skon 2	3	0	3	Engineering Mechanics-Dynamics	Engineering Mechanics-Movement	Compulsory	
			20			Total hours and units of the first semester			

University of Mosul – College of Engineering – Mechanical Engineering Department
Curriculum / Courses/ Second level/ Academic Year 2024–2025

Second Academic Level (Second Semester)									
Observations	Course Code	Smoother, if any	Number of Units	Number of practical hours	Number of theoretical hours	Course Name		Requirement Type (Compulsory – Optional)	Requirement Name
						In English	In Arabic		
	ENGC226	No	2	0	2	Engineering Economics	Engineering Economics	Compulsory	College Requirements
	ENGC227	Calculus I, II	2	0	2	Statistics	Statistics	Compulsory	
Compulsory for students of the Department of Mechanics	ENGE230	Engineering Mathematics 1	3	0	3	Engineering Math II	Engineering Mathematics 2	elective	
	MEC251	Thermodynamics 1	3	0	3	Thermodynamics II	Thermodynamics 2	Compulsory	Department Requirements
	MEC252	Mechanics of Materials 1	2	0	2	Mechanics of Materials II	Mechanics of Materials 2	Compulsory	
	MEC253	Fluid Mechanics 1	2	0	2	Fluid Mechanics II	Fluid Mechanics 2	Compulsory	
	MEC254	Mechanical Drawing	2	3	1	Computer Aided Mechanical Drawing	Computer Aided Mechanical Drawing	Compulsory	
	MEC256	No	1	3	0	Mechanical Engineering Laboratory I	Laboratories 1	Compulsory	
The student chooses one course Number of units required = 1 unit	MEC260	No	1	2	0	Computer Aid Engineering Applications	Computer Aided Engineering Applications	elective	
	MEC261	Metallurgical Physics 1	1	0	1	Non-Destructive Testing	Non-destructive testing	elective	
			18			Total hours and units of the second semester			

University of Mosul – College of Engineering – Mechanical Engineering Department
Curriculum / Courses/ Third level/ Academic Year 2024–2025

Level (III) - First Semester									
Observations	Course Code	Smoother, if any	Number of Units	Number of practical hours	Number of theoretical hours	Course Name		Requirement Type (Compulsory – Optional)	Requirement Name
						In English			
			2	0	2	English Language-Intermediate	English-Intermediate	Compulsory	University Requirements
Compulsory for mechanical department	ENGC325		2	0	2	Engineering Management	Engineering Management	Compulsory	College Requirements
	MEC301	Engineering MathematicsI	3	0	3	Engineering Analysis	Engineering Analytics	Compulsory	Department Requirements
	MEC302	ThermodynamicsII	3	0	3	Conduction Heat Transfer	Heat transfer by arrival		
	MEC303	Mechanics of MaterialsII	2	0	2	Kinematic Analysis	Kinetic analysis		
	MEC304	Introduction to Electrical Engineering	2	0	2	Electric Machines	Electrical Machines		
	MEC305	Manufacturing ProcessesI	1	2	0	Mechanical Workshop	Mechanical Workshop		
The student chooses only one course	MEC331	Fluid MechanicsII	3	0	3	Compressible Fluid Flow	Compressed fluid flow	elective	
	MEC332	Metallurgical Physics I	3	2	2	Metallurgy	minerals		
			18	2/4	16/17	Total hours and units of the first semester			

University of Mosul – College of Engineering – Mechanical Engineering Department
Curriculum / Courses/ Third level/ Academic Year 2024–2025

Level (III) - Second Semester									
Observations	Course Code	Smoother, if any	Number of Units	Number of practical	Number of theoretical hours	Course Name In English		Requirement Type (Compulsory – Optional)	Requirement Name
	UOMC104		2	0	2	Professional Ethics	Professional Ethics	Compulsory	University Requirements
Compulsory for mechanical department	ENGE329		2	0	2	Public Safety	Public Safety	elective	College Requirements
	ENGE320	MathI & II	2	2	1	Numerical Analysis	Numerical Analysis		
	MEC352	Heat transfer by arrival	2	0	2	Convection and Radiation Heat Transfer	Heat transfer by convection and radiation	Compulsory	Department Requirements
	MEC353	Kinetic analysis	3	0	3	Introduction to Machine Design	Introduction to Machinery Design		
	MEC354	Kinetic analysis	2	0	2	Machines Dynamics	Dynamics of Machines		
	MEC355	LaboratoriesI	1	3	0	Laboratories II	Laboratories II		
The student chooses one course	MEC360	Compressed fluid flow	2	0	2	Turbo-machinery	Turbo Machinery	elective	
	MEC361	minerals	2	0	2	Metallic-Engineering Materials	Metallurgical Engineering Materials		
The student chooses one course	MEC362	ThermodynamicsII	2	0	2	Introduction to Combustion	Introduction to Combustion	elective	
	MEC363	Manufacturing OperationsI	2	3	1	Intermediate Manufacturing Processes	Intermediate Manufacturing Processes		
The student chooses one course	MEC364	Heat transfer by arrival	2	0	2	Solar Energy	Solar Energy	elective	
	MEC465	minerals	2	0	2	Introduction to Composite Materials	Introduction to Composite Materials		
			20	5/8	17/18	Total hours and units of the second semester			

University of Mosul – College of Engineering – Mechanical Engineering Department
Curriculum / Courses/ Fourth level/ Academic Year 2024–2025

Fourth academic level (first semester)								
Observations	Course Code	Smoother, if any	Number of Units	Number of practical hours	Number of theoretical hours	Course Name: In English		Requirement Type (Compulsory – Optional)	Requirement Name
	MEC401	,Engineering Mechanics-Motion Engineering Analytics	3	0	3	Vibration I	Vibrations I	Compulsory	Department Requirements
	MEC402	Introduction to Combustion	3	0	3	Internal Combustion Engines	Internal Combustion Machines		
	MEC403	Introduction to Machinery Design	3	0	3	Design of Machines Parts	Design of machine parts		
	MEC404	Penultimate Chapter	1	0	3	Design Project I	Design Project I		
	MEC405	Heat transfer 2	3	0	3	Air Conditioning	air conditioning		
The student chooses at least six units	MEC421	Thermodynamics 2	3	0	3	Power Plants	Qudra Stations	elective	
	MEC422	Renewable energies I, Turbomachinery	3	0	3	Renewable Energies II	Renewable Energy II		
	MEC423	Metallurgical Engineering Materials	2	0	2	Elasticity	Flexibility		
	MEC424	Manufacturing Processes 2	2	0	2	Quality Control	Quality control		
	MEC425	Metallurgical Engineering Materials	2	0	2	Nonmetallic-Engineering Materials	Non-metallic engineering materials		
			19			Total hours and units of the first semester			

University of Mosul – College of Engineering – Mechanical Engineering Department
Curriculum / Courses/ Fourth level/ Academic Year 2024–2025

Fourth Academic Level (Second Semester)									
Observations	Course Code	Smoother, if any	Number of Units	Number of practical hours	Number of theoretical hours	Course Name In English		Requirement Type (Compulsory – Optional)	Requirement Name
		English-Mediterranean	2	0	2	English Language-Above Intermediate	English-Upper-Intermediate	Compulsory	University Requirements
	MEC451	Vibrations I	3	0	3	Control and Measurements	Control and measurements	Compulsory	Department Requirements
	MEC452	Laboratories II	1	3	0	Laboratories III	Laboratories III		
	MEC453	Vibrations I	3	0	3	Vibration II	Vibrations II		
	MEC454	Chapter Final	1			Design Project II	Graduation Project 2		
The student chooses at least 7 units	MEC460	Introduction to Combustion	2	0	2	Pollution	pollution	elective	
	MEC461	air conditioning	2	0	2	Refrigeration	Refrigeration		
	MEC462	Heat transfer 2	3	2	2	Computer Aided Thermal System Design	Computer thermal systems design		
	MEC463	Design of machine parts	3	0	3	Design and Analysis of Control Systems	Analysis and design of control systems		
	MEC464	Design of machine parts	2	2	1	Computer Aided Machine Design	Computer Machine Design		
	MEC465	Flexibility	2	0	2	Plasticity	Plasticity		
			17			Total hours and units of the second semester			

Postgraduate studies

/ Programs Studies The Supreme in to divide Engineering Mechanical Faculty of Engineering

No.	The program name	Program name
1	• Programs degree PhD in Engineering Mechanical	• Ph.D Degree Programs in Mechanical Engineering
2	• Programs degree Masters in Engineering Mechanical	• M.Sc. Degree Programs in Mechanical Engineering
3	• Programs degree Masters in engineering Production And minerals	• M.Sc. Degree Programs in Production and Metallurgy Engineering
4	• Programs degree Masters in engineering Thermals	• M.Sc. Degree Programs in Thermal engineering

Research Directions of the Department of Mechanical Engineering

The specialization of mechanical engineering includes a wide range of ,engineering specializations that cover wide areas of life. With this diversity the research axes in the Department of Mechanical Engineering have diversified, the most prominent of which are:

The first axis: Thermal power: :refrigeration and air conditioning research This axis includes research on electric power generation units and improving their performance and thermal efficiency, heat exchangers and increasing their performance, as well as research on developing solar systems and exploiting them in generating electric power, heating and cooling, and research on internal combustion engines that aim to reduce fuel consumption as well as reduce environmental pollution resulting from the combustion process, and research on mass and heat transfer in porous media and research on improving heat transfer in heat exchangers, in addition to research on thermal simulation of buildings.

The second axis: Applied mechanics research. This branch includes research on the mathematical representation of mechanical and dynamic systems and mathematical modeling of flexible mechanical systems using the finite element method, traditional and intelligent control systems, fuzzy control, identification of dynamic systems, friction modeling in dynamic systems, and design of adaptive control systems. It also includes the design and analysis of mechanical and dynamic systems, machine parts, and the .kinetic and dynamic behavior of mechanical system arms

Research on applications of ultrasound energy technology in describing the vibrational and dynamic characteristics of vibrationally excited tools and their ability to transmit energy and employ it in several medical, engineering and manufacturing fields, vibration research of rotating shafts that transmit energy and turbines, research on the ranges of vibrations allowed within the ,operation of systems that rely on the use of engines, pumps and compressors research on diagnosing faults and defects in vibrating parts, and finally research on preventive maintenance of the operation of motor systems.

The third axis: Production and metal research: It can be summarized in eight sections: metal sheet forming, plastic deformation of metals, nano powder technology and manufacturing, in addition to computational modeling of manufacturing processes, heat treatments and diffusion of solid materials, tribology processes, material characterization, and finally .composite materials.

University of Mosul
College of Engineering

This guide has been prepared under the guidance of the Dean of the College of Engineering
Professor Dr. Abdul Rahim Ibrahim Jassim

Under the supervision of the Head of the Mechanical Engineering Department
Assistant Professor
Dr. Omar Mohammed Hamdoun
To serve as a reference for introducing the Department of Mechanical Engineering, its members, and the study programs for undergraduate and graduate studies

coordination
Department of Media and Government Communication at the College of Engineering

2025 Edition