

**Ministry of Higher Education and Scientific Research  
Scientific Supervision and Scientific Evaluation Apparatus  
Directorate of Quality Assurance and Academic Accreditation  
Accreditation Department**



# **Academic Program and Course Description Guide**

**2024**

## Academic Program Description Form

**University Name:** University of Mosul

**Faculty/Institute:** College of Engineering

**Scientific Department:** Mechanical Engineering Department

**Academic or Professional Program Name:** Bachelor / Mechanical Engineering

**Final Certificate Name:** Bachelor of Science in Mechanical Engineering

**Academic System:** Bologna process – semester – courses

**Description Preparation Date:** 3/20/2024

**File Completion Date:** 3/20/2024

Signature:

Head of Department Name:

**Dr. Ayman T. Hamid**

Date:

Signature:

Scientific Associate Name:

**Dr Omar M. Hamdoun.**

Date:

**The file is checked by:**

**Department of Quality Assurance and University Performance**

**Director of the Quality Assurance and University Performance Department:**

Date:

Signature:

**Approval of the Dean**

## **1. Program Vision**

The department is looking to be one of the leading departments in the field of mechanical engineering at the level of Iraq and the region through graduating engineers specializing in mechanical engineering following the latest approved scientific curricula and using the latest scientific teaching methods, such as modern laboratories and teaching methods.

## **2. Program Mission**

1. Graduating qualified engineers with various mechanical engineering disciplines, which include the fundamentals of mechanical design, thermal capacity, different production methods, air conditioning, and refrigeration, to have the ability to be creative and innovative in various engineering fields and keep pace with scientific development.
2. Providing practical opportunities for students to learn about the principles and scientific facts of engineering along with the theoretical aspect by establishing modern laboratories and engineering workshops equipped with the latest types of equipment and laboratory supplies and organizing scientific trips to various institutions of the country.
3. Providing the best possibilities for building the leadership qualities of graduate students by teaching them outstanding teamwork, mobilizing student efforts to participate and contribute to student community service, and urging students to be creative and innovative to achieve the community's need for qualified mechanical engineers.
4. Holding seminars, scientific conferences, and training courses for the employees of all departments and the different industrial sectors to inform

them of the most prominent scientific and technological developments to enhance the efficiency and capacity of engineering staff in all sectors of the country.

### 3. Program Objectives

1. Preparing qualified scientifically and socially integrated engineers, developing their passion for work and scientific research, and the ability to think creatively and collaborative teamwork, in addition to practicing modern technologies and industrial applications.
2. Prepare engineers to develop and participate in scientific research and studies in the field of department specializations, especially in finding solutions to various issues facing economic and social development.
3. Communicating with the community and its institutions, providing engineering services, and being open to the community, encouraging the public and private sectors to consolidate a good relationship with the university through offering consultations and holding specialized training courses in various fields of mechanical engineering according to the requirements of the community.
4. Communicate with reputable international universities, exchange experiences and modern scientific information to develop theoretical and practical aspects, and urge researchers to apply for international funding and grant projects.
5. Supporting the Scientific Research Ethics Committee.
6. Urging researchers to apply for international grants and funding projects.

### 4. Program Accreditation

Not yet

### 5. Other external influences

Doesn't have

## 6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	6	15	8%	Basic course
College Requirements	3	6	4%	Basic course
Department Requirements	65	127	88%	Basic course
Summer Training	Exist			
Other				

\* This can include notes on whether the course is basic or optional.

## 7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
2023 – 2024 / First level / Bologna Process	ME101	Engineering Mechanics-Statics I	Theoretical	3
	ME102	Mathematics I	Theoretical	3
	ME103	Manufacturing Processes I	Theoretical & practical	6
	ME104	Engineering Drawing	Theoretical & practical	3
	ME105	Physics for Engineers	Theoretical	3
	UOM103	The Computer	Theoretical & practical	3
	UOM101	Arabic Language	Theoretical	2
	ME151	Engineering Mechanics-Statics II	Theoretical	3
	ME152	Mathematics II	Theoretical	3
	ME153	Physics of Metallurgy	Theoretical	3
	ME154	Introduction to Electrical Engineering	Theoretical	3
	ME155	Energy and Sustainability	Theoretical	3
	UOM102	English language I	Theoretical	2

	UOM104	Democracy and Human Rights	<b>Theoretical</b>	2
<b>2023 – 2024 / Second stage / Semester</b>	ME202	Mathematics III	<b>Theoretical</b>	3
	ME205	Fluid Mechanics I	<b>Theoretical</b>	2
	ME208	Thermodynamics I	<b>Theoretical</b>	2
	ME201	Mechanics- Engineering Dynamics I	<b>Theoretical</b>	2
	ME207	Mechanics of Materials I	<b>Theoretical</b>	2
	ME204	Mechanical Drawing	<b>Theoretical &amp; practical</b>	3
	ME206	Metallurgy	<b>Theoretical &amp; practical</b>	2
	ME203	Computer Aid Engineering Applications	<b>Practical</b>	2
	ME252	Mathematics IV	<b>Theoretical</b>	3
	ME255	Fluid Mechanics II	<b>Theoretical</b>	2
	ME258	Thermodynamics II	<b>Theoretical</b>	2
	ME251	Engineering Mechanics- Dynamics II	<b>Theoretical</b>	2
	ME257	Mechanics of Materials II	<b>Theoretical</b>	2
	ME254	Computer Aided Mechanical Drawing	<b>Theoretical &amp; practical</b>	4
	ME253	English Language	<b>Theoretical</b>	2
	ME259	Mechanical Engineering Laboratory I	<b>Practical</b>	3
		Baath Party Crimes	<b>Theoretical</b>	2
<b>2023 – 2024 / Second stage / Courses</b>		English Language - intermediate	<b>Theoretical</b>	2
	ENGC325	Engineering Management	<b>Theoretical</b>	2
	MEC301	Engineering Analysis	<b>Theoretical</b>	3
	MEC302	Conduction Heat Transfer	<b>Theoretical</b>	3
	MEC303	Kinematic Analysis	<b>Theoretical</b>	2
	MEC304	Electric Machines	<b>Theoretical</b>	2
	MEC305	Mechanical Workshop	<b>theoretical &amp; practical</b>	2
	MEC331	Compressible Fluid Flow	<b>Theoretical</b>	3
	MEC332	Metallurgy	<b>Theoretical &amp; practical</b>	4

	UOMC104	Professional ethics	<b>Theoretical</b>	2
	ENGE329	Public Safety	<b>Theoretical</b>	2
	ENGE320	Numerical Analysis	<b>Theoretical &amp; practical</b>	3
	MEC352	Convection and Heat Transfer Radiation	<b>Theoretical</b>	2
	MEC353	Introduction to Machine Design	<b>Theoretical</b>	3
	MEC354	Machines Dynamics	<b>Theoretical</b>	2
	MEC355	Mechanical Engineering Laboratory II	<b>Practical</b>	3
	MEC360	Turbomachinery	<b>Theoretical</b>	2
	MEC361	Metallic Engineering Materials	<b>Theoretical</b>	2
	MEC362	Introduction to Combustion	<b>Theoretical</b>	2
	MEC363	Medium Manufacturing Processes	<b>Theoretical &amp; practical</b>	4
	MEC364	Solar Energy	<b>Theoretical</b>	2
	MEC465	Introduction to Composite Materials	<b>Theoretical</b>	2
<b>2023 - 2024 / Second stage / Courses</b>	MEC401	Introduction to Vibrations	<b>Theoretical</b>	3
	MEC402	Internal Combustion Engines	<b>Theoretical</b>	3
	MEC403	Machine Element Design	<b>Theoretical</b>	3
	MEC404	Engineering Project I	<b>Theoretical &amp; practical</b>	3
	MEC405	Air-conditioning	<b>Theoretical</b>	3
	MEC421	Power Plant	<b>Theoretical</b>	3
	MEC422	Renewable Energy II	<b>Theoretical</b>	3
	MEC423	Flexibility	<b>Theoretical</b>	2
	MEC424	Quality Control	<b>Theoretical</b>	2
	MEC425	Non-Metallic Engineering Materials	<b>Theoretical</b>	2
		English Language - Upper mediate	<b>Theoretical</b>	3
	MEC451	Control and Measurements	<b>Theoretical</b>	3
	MEC452	Mechanical Engineering Laboratory III	<b>Practical</b>	3
	MEC453	Medium Vibration	<b>Theoretical</b>	2

	MEC454	Engineering Project II	<b>Theoretical &amp; practical</b>	2
	MEC460	Pollution	<b>Theoretical</b>	2
	MEC461	Refrigeration	<b>Theoretical</b>	3
	MEC462	Computer Aided Thermal System Design	<b>Theoretical</b>	1
	MEC463	Design and Analysis of Control System	<b>Theoretical</b>	2
	MEC464	Computer Aided Mechanical Design	<b>Theoretical</b>	2
	MEC465	Plasticity	<b>Theoretical</b>	2

### 8. Expected learning outcomes of the program

<b>Knowledge</b>	
<b>A1</b> – The ability to distinguish, identify, define, formulate, and solve engineering problems by applying the principles of engineering, science, and mathematics.	<b>A3</b> – The ability to communicate skillfully orally with a group of people and in writing with various administrative levels.
<b>A2</b> – The ability to produce engineering designs that meet the required needs within certain constraints and apply analysis and synthesis in the design process.	<b>A4</b> – Interpreting numerical data and applying mathematical methods to analyze problems.
<b>Skills</b>	
<b>B1</b> – Ability to establish and perform appropriate measurements and tests while ensuring quality, analyze and interpret results, and use engineering judgment to reach conclusions.	<b>B3</b> – Ability to work appropriately within teams, set goals, plan activities, meet deadlines, and manage risks.
<b>B2</b> – The ability to use standard tools and techniques to conduct and design practical experiments for mechanical and electromechanical systems and to analyze and interpret data correctly.	<b>B4</b> – The possibility of effectively using information technology and modern engineering applications to start scientific research projects in the future.
<b>Ethics</b>	
<b>C1</b> – Ability to recognize ethical and	<b>C3</b> – The ability to recognize the ongoing



professional responsibilities in engineering issues and make informed judgments while considering the consequences worldwide in financial, environmental, and societal considerations.	necessity of professional knowledge growth and how to find, evaluate, accumulate, and apply it correctly.
<b>C2</b> – Commitment to the foundations of professionalism, respect for privacy principles, and maintaining confidentiality related to communication skills and writing reports while being familiar with economic, legal, health, social, and security determinants.	<b>C4</b> – Applying modern engineering techniques, skills, tools, and intelligent control of mechanical systems.

<b>9. Teaching and Learning Strategies</b>	
Theoretical lectures.	Computer laboratories.
Discussion sessions.	Graduation projects.
Laboratory experiments.	Industrial training.

<b>10. Evaluation methods</b>	
Quizzes, mid-term, and final exams.	Practical exams and homework
Reports	Seminars.

<b>11. Faculty</b>			
<b>Faculty Members</b>			
<b>Academic Rank</b>	<b>Specialization</b>	<b>Special Requirements/ Skills</b>	<b>The number of teaching staff</b>

	General	Special			Staff	Lecturer
Professor	Mech. Engineering	Thermal Power				1
Assist. Professor	Mech. Engineering	Thermal Power				8
Assist. Professor	Mech. Engineering	Production & Metallurgy				4
Lecturer	Mech. Engineering	Thermal Power				12
Lecturer	Mech. Engineering	Applied Mechanics				8
Lecturer	Mech. Engineering	Production & Metallurgy				7
Assist. Lecturer	Mech. Engineering	Thermal Power				3
Assist. Lecturer	Mech. Engineering	Applied Mechanics				2
Assist. Lecturer	Mech. Engineering	Production & Metallurgy				2
Assist. Lecturer	Elect. Engineering	Power & Machines				1
Assist. Lecturer	Administration & Economics	Administration				1

### Professional Development

#### Mentoring new faculty members

Teaching methods workshops

Training courses

Continuing education workshops

Scientific seminars, workshops, and seminars

#### Professional development of faculty members

A plan to develop the skills of the faculty in the Mechanical Engineering Department by involving the largest number of them in local and international conferences. Also, they should be encouraged to join education workshops, continuous scientific seminars, workshops, and seminars that are held inside and outside the university's corridors.

## 12. Acceptance Criterion

Standard admission approved by Ministry of Higher Education and Scientific Research

## 13. The most important sources of information about the program

Electronic scientific resources are available online.

Textbooks and references are available in the Department Education office, Department Library, College Library, and University Library.

## 14. Program Development Plan

An improvement plan is prepared according to a proposed timetable to improve the educational program's outcomes. Working to improve and enhance the academic program's outcomes by improving faculty members' performance through intensive educational courses, continuing education courses, publishing research papers, and completing promotion procedures to a higher academic rank. With the help of the Quality Assurance Committee and the Department's Scientific Committee, a questionnaire is being prepared directed to several government and private sector institutions to ask about their opinions on the performance of the department's graduates, in addition to their proposals towards improving and enhancing the outcomes of the program. The results of the questionnaires are collected during the academic year. The relevant committees analyze and discuss the results to make recommendations and proposals. In addition, the program outcomes are reviewed annually by the faculty in the Mechanical Engineering Department. Also, the results are analyzed to measure the extent to which the curriculum is compatible with the labor market requirements and to determine whether there is a need for change. Based on the results of the data analysis, the department headship is informed of the proposals and recommendations reached by the faculty.

Program Skills Outline															
				Required program Learning outcomes											
Year/ Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First level 2024-2023	ENGC123	Engineering Drawing	Basic		✓										
	UOMC102	Computer	Basic	✓	✓			✓					✓		✓
	UOMC100	Arabic Language	Basic		✓								✓		
	ENGC121	Mathematics I	Basic	✓	✓			✓							
	ENGE133	Physics	Basic	✓	✓			✓							
	MEC102	Manufacturing Processes I	Basic	✓	✓							✓			
	MEC104	Introduction to Electrical Engineering	Basic	✓	✓										
	MEC101	Engineering Mechanics-Statics I	Basic	✓	✓			✓							
	UOMC101	English language for beginner	Basic		✓										
		Energy and Sustainability	Basic	✓						✓				✓	
	UOMC103	Democracy and Human Rights	Basic		✓									✓	
	ENGC122	Mathematics II	Basic	✓	✓			✓							
	MEC151	Engineering Mechanics-Statics II	Basic	✓	✓			✓							
	MEC153	Physics of Metallurgy	Basic	✓	✓			✓							
Second stage 2024-2023	MEC202	Mechanics of Materials I	Basic	✓	✓		✓								
		English Language	Basic		✓								✓		
	ENGE228	Mathematics III	Basic	✓	✓		✓								
	MEC201	Thermodynamics I	Basic	✓	✓		✓								

	MEC203	Fluid Mechanics I	Basic	✓	✓		✓								
	MEC204	Mechanical Drawing	Basic	✓	✓										
	MEC205	Physics for Engineers	Basic	✓			✓								
	MEC206	Mechanics- Engineering Dynamics I	Basic	✓	✓		✓								
		Baath Party Crimes	Basic		✓								✓		
	ENGE230	Mathematics IV	Basic	✓	✓		✓								
	MEC251	Thermodynamics II	Basic	✓	✓		✓								
	MEC252	Mechanics of Materials II	Basic	✓	✓		✓								
	MEC253	Fluid Mechanics II	Basic	✓	✓		✓								
	MEC254	Computer Aided Mechanical Drawing	Basic	✓									✓		
	MEC2 56	Mechanical Engineering Laboratory I	Basic	✓	✓		✓					✓			
	MEC260	Computer Aid Engineering Applications	Basic	✓			✓		✓				✓		
Third stage 2024-2023		English Language - intermediate	Basic		✓								✓		
	ENGC325	Engineering Management	Basic	✓									✓		
	MEC301	Engineering Analysis	Basic	✓	✓		✓								
	MEC302	Conduction Heat Transfer	Basic	✓	✓		✓								
	MEC303	Kinematic Analysis	Basic	✓	✓		✓								
	MEC304	Electric Machines	Basic	✓							✓				
	MEC305	Mechanical Workshop	Basic	✓							✓	✓			

	MEC331	Fluids Flow by Pressure	Basic	✓	✓		✓								
	MEC332	Metallurgy	Basic	✓			✓								
	UOMC104	Professional ethics	Basic			✓						✓			
	ENGE329	Public Safety	Basic			✓						✓			
	ENGE320	Numerical Analysis	Basic	✓			✓	✓	✓			✓			
	MEC352	Convection and Heat Transfer Radiation	Basic	✓	✓		✓								
	MEC353	Introduction to Machine Design	Basic	✓	✓		✓	✓							
	MEC354	Machines Dynamics	Basic	✓	✓		✓								
	MEC355	Mechanical Engineering Laboratory II	Basic	✓							✓				
	MEC360	Turbomachinery	Basic	✓	✓		✓			✓					
	MEC361	Metallic Engineering Materials	Basic	✓	✓		✓								
	MEC362	Introduction to Combustion	Basic	✓	✓		✓			✓					
	MEC363	Intermediate Manufacturing Processes	Basic	✓						✓					
	MEC364	Solar Energy	Basic	✓						✓					
	MEC465	Introduction to Composite Materials	Basic	✓	✓										
Forth stage 2024-2023	MEC401	Introduction to Vibrations	Basic	✓	✓			✓						✓	
	MEC402	Internal Combustion Engines	Basic	✓	✓		✓			✓					
	MEC403	Machine Element Design	Basic	✓	✓		✓	✓							
	MEC404	Engineering Project I	Basic	✓	✓									✓	

MEC405	Control and measurements	<b>Basic</b>	✓	✓		✓			✓		✓			
MEC421	Power Plants	<b>Basic</b>	✓	✓		✓			✓					
MEC425	Non Metallic Engineering Materials	<b>Basic</b>	✓	✓		✓								
MEC422	Renewable Energy II	<b>Basic</b>	✓						✓					
MEC423	Elasticity	<b>Basic</b>	✓	✓		✓								
	English Language -Upper mediate	<b>Basic</b>		✓										
MEC451	Design and Analysis of Control System	<b>Basic</b>	✓				✓						✓	
MEC452	Mechanical Engineering Laboratory III	<b>Basic</b>	✓							✓			✓	
MEC453	Air-conditioning	<b>Basic</b>	✓	✓		✓								
MEC454	Engineering Project II	<b>Basic</b>	✓	✓										
MEC460	Pollution	<b>Basic</b>	✓										✓	
MEC465	Plasticity	<b>Basic</b>	✓	✓		✓								
MEC461	Refrigeration	<b>Basic</b>	✓	✓		✓								
MEC464	Computer Aided Mechanical Design	<b>Basic</b>	✓	✓		✓	✓	✓						
MEC463	Computer Aided Thermal System Design	<b>Basic</b>	✓				✓							
MEC467	Intermediate Vibration	<b>Basic</b>	✓	✓		✓								

- Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

