Program Catalogue | 2025-2026 | دليل البرنامج الدراسي

Al Mustaqbal University
جامعة المستقبل

First Cycle – Bachelor's Degree (B.Sc.)

Fuel and Energy Techniques Engineering Department

بكالوريوس – هندسة تقنيات الوقود والطاقة (الدورة الأولى)

Table of Contents | جدول المحتويات

1. Mission & Vision statement

Vision Statement

The Department of Fuel and Energy Technologies Engineering at Al-Mustaqbal University / College of Engineering and Engineering Technologies was established in response to the growing need for qualified engineers in the fields of petroleum, natural gas, and energy in Iraq, as well as to meet the demands of the local labor market and contribute to the development of both the public and private sectors**.**

The department aims to graduate and develop engineering professionals specialized in fuel and energy, utilize engineering knowledge in the field of energy to enhance the scientific and technical capabilities of the country's energy industry, promote the efficient and effective use of energy and natural resources essential for achieving sustainable development in Iraq, and strengthen cooperation at both national and international levels.

Mission Statement

The Department of Fuel and Energy Technologies Engineering at Al-Mustaqbal University is a distinguished department that focuses on the fields of energy and earth resources. The department strives to develop and implement academic plans and conduct applied research in the field of renewable energy with the goal of preserving the environment through contributing to innovation and intellectual creativity in research and studies.

2. Program specification

The department also works to spread knowledge and expertise throughout society, provide scientific support to educational and industrial institutions, and endeavor to localize and develop fuel and renewable energy technologies suitable for the nature of Iraq, as well as enhance energy efficiency and management to serve sustainable development in our nation.

Programme code	**BSc-FET**	**ECTS**	**240**
Duration	**4 levels , 8 Semesters**	**Method of Attendance**	**Full Time**

Fuel and Energy Technologies Engineering prepares students for careers in the fuel and energy industries by providing them with skills to improve themselves. Thus, the student will have extensive knowledge of refinery processing, petrochemicals, crude oil, and natural gas processing. Fuel and energy courses are integrated into the curriculum. Developing and testing solutions to improve industrial equipment to maximize petroleum refining Students will have the opportunity to learn the principles of chemical engineering, energy engineering, and related materials, and they will be prepared to keep pace with the development of modern methods required in the labor market and companies dealing with the design, implementation, and operation of plants and refineries. In addition, students will be equipped with knowledge of modern design techniques or optimization of technical calculations for renewable energy in industrial settings.

Level 1 exposes students to the fundamental principles of chemical engineering and chemistry, which are suitable for progression to all programs within the department.

Course-specific core topics are covered at Level 2 and prepare for research-oriented subject modules at Levels 3 and 4. FET graduates are therefore trained to understand how research influences teaching, according to the university's and department's mission statements.

In levels 2, 3 and 4 FET students cover mass balance and energy balance after taking basic principles and covers knowledge of chemistry topics. Students acquire skills in oil refining. Ultimately, FET graduates will acquire knowledge and skills in analyzing the thermodynamic cycles of steam power plants and understanding their construction.

The development of research principles begins and is developed through the implementation of practical assignments, which are either integrated into lecture units or delivered through specialized practical units, research seminars and tutorials.

In levels 5 to 8, students acquire comprehensive knowledge and skills related to equipment and reactor design. They develop the ability to analyze and solve problems. In addition, they acquire knowledge of software applications and do their own study to meet final project requirements.

3. Program Goal

1. Preparing technical engineers specialized in the fields of fuel production and finding sustainable energy sources.
2. Design and development of industrial units to maximize the petroleum refinery and energy.
3. The ability to deal with the different types of sustainable energy sources such as solar energy, biogas, wind energy, geothermal energy, and, energy storage.
4. Design or optimization of technical calculations for renewable energy in industrial applications
5. Integrate academic preparation with oil and gas refinery engineering technology developments.
6. Ability to deal with renewable and non-renewable energy sources.
7. The ability to deal with risks such as pollution, identify and assess risks in the workplace and estimate damage and risks as a result of the explosion

4. Student Learning Outcomes

The FET program provides students with a solid foundation in the fuel and energy technology field, envisaging various employment capabilities and careers. Graduates have knowledge and skills in general FET issues and, depending on the selected specialization, the knowledge and technical skills of FET. They know the principles of fuel and sustainable energy and are well acquainted with the devices cooperating with refineries, power stations, and other related processes. They have knowledge of unit operation, measurement, and control engineering; they develop software skills and know how to design equipment and reactors They also have a basic knowledge of problems related to internal combustion engines and understand internal combustion engine methods and applications. They had the ability to deal with risks such as pollution, identify and assess risks in the workplace, and estimate damage and risks as a result of the explosion.

Outcome 1

Understanding of allied knowledge

Graduates will be able to demonstrate broad knowledge of refinery processing, petrochemicals, crude oil, natural gas processing, and other related processes

Outcome 2

Oral and Written Communication

Graduates will be able to formally communicate the results of FET investigations using both oral and written communication skills.

Outcome 3

technical and cognitive skills

Graduates will be able to solve various practical engineering problems related FET (diffusion, distillation, gas absorption column, extraction, types of heat transfer, fins, heat exchangers, evaporation and condensation, ….)

Outcome 4

Critical thinking and analytical skills

Graduates will be able to identify emerging problems and attempt to solve them using logical and critical thinking methods using modeling, design, and prediction.

Outcome 5

Appropriate research tools and techniques

Graduates will be able to use software such as AspenPlus and HYSYS to design and simulate industrial plants and equipment for fuel and power production such as reactors, distillation columns, packed columns, heat exchangers, absorbers, etc..

Outcome 6

The skill of dealing with different types of energy sources

The ability to deal with the different types of sustainable energy sources such as solar energy, biogas, wind energy, geothermal energy, and, energy storage.

Outcome 7

Group/team leadership

Graduates will be able self-motivated, cooperates effectively with other professionals in different disciplines, backgrounds and interests to solve problems, works lucidly in confusing situations under pressure and demonstrates knowledge of and commitment following safety procedure for self and others.

Outcome 8

Own professional development

Graduates will be able to take his own decisions, planning and problem solving, and stay updated professionally.

5. Acadamic Staff

1. Ammar Abdulkadhim Fathi | Ph.D in Mechanical Engineering | Assistant Professor
   Email : ammarabdulkadhim@uomus.edu.iq
   Mobile No : +964 780 158 6849

2. Hussein Kadhim Halwas | Ph.D in Mechanical Engineering | Lecturer
   Email: hussein.kadhim@uomus.edu.iq
   Mobile No : +964 7841709669

3. Mujtaba Abdulkadhim Fleiḥ | Ph.D in Mechanical Engineering | Lecturer
   Email : mujtaba_abdulkadhim@uomus.edu.iq
   Mobile No : +964 7813890415

4. Shahd Ammar Hatem | MSc in Chemical Engineering | Assistant Lecturer
   Email: Shahd.Ammar.Hatem@uomus.edu.iq
   Mobile No.: +964 7736114992

5. Zahraa Salah Hadi I MSc in Material Engieering I Assistant Lecture
   Email : Zahraa.Salah.Hadi@uomus.edu.iq
   Mbile No : +964 7760116455

6. Elaf jasem mohammed | Msc in material engineering | Assistant Lecturer
   Email : elaf.jasem.mohammed@uomus.edu.iq
   Mobile No : +964 7836576401

7. Shahad Mahmood Mohammed | MSc in Chemical Engineering | Assistant Lecturer
   Email : shahad.mahmood.mohammed@uomus.edu.iq
   Mobile No : +964 782 479 8255

6. Gredits, Grading and GPA

Credits

Middle 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 30 hrs student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	**التقدير**	**Marks (%)**	**Definition**
Success Group (50 - 100)	A - Excellent	**امتياز**	90 - 100	Outstanding Performance
	B - Very Good	**جيد جدا**	80 - 89	Above average with some errors
	C - Good	**جيد**	70 - 79	Sound work with notable errors
	D - Satisfactory	**متوسط**	60 - 69	Fair but with major shortcomings
	E - Sufficient	**مقبول**	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	**راسب - قيد المعالجة**	(45-49)	More work required but credit awarded
	F – Fail	**راسب**	(0-44)	Considerable amount of work required
Note: 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

7. Curriculum/modules

Level-1 / Semester-1

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

No	Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
			hr/sem	hr/sem	hr/sem			
1	UOMU0206011	Analytical Chemistry	116	59	175	7.00	C	
2	UOMU0206012	Mathematic 1	73	102	175	7.00	B	
3	UOMU0206014	Engineering Drawing	59	66	125	5.00	B	
4	UOMU0000031	Computer Principles	59	16	75	3.00	S	
5	UOMU0000004	English 1	45	5	50	2.00	S	
6	UOMU0206013	workshops	90	60	150	6.00	S	
			442	308	750	30.00		

Level-1 / Semester-2

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

No	Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
			hr/sem	hr/sem	hr/sem			
1	UOMU0206022	Principles of Chemical Engineering	73	102	175	7.00	C	
2	UOMU0206023	Engineering Mechanics	73	77	150	6.00	B	
3	UOMU0206024	Mathematic 2	73	77	150	6.00	B	**Mathematic** 1
4	UOMU0000016	Human Rights and democaracy	45	5	50	2.00	S	
5	UOMU0206021	Organic Chemistry	115	60	175	7.00	C	
6	UOMU0000010	Arabic	45	5	50	2.00	S	
			424	326	750	30		

Level-2 / Semester-3

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

No	Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
			hr/sem	hr/sem	hr/sem			
1	UOMU0206031	Mass Balance and energy balance	73	77	150	6.00	C	**Principles of Chemical Engineering**
2	UOMU0206033	Thermodynamics 1	73	77	150	6.00	C	
3	UOMU0206032	Physical Chemistry	101	49	150	6.00	C	
4	UOMU0206034	Mathematic 3	59	66	125	5.00	B	**Mathematic 2**
5	UOMU0000033	Computer Applications	59	16	75	3.00	S	**اساسيات الحاسوب**
6	UOMU0000006	English 2	45	5	50	2.00	C	
7	UOMU0000014	Defunct Baath Party Crimes	45	5	50	2.00	S	
			455	295	750	30		

Level-2 / Semester-4

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

No	Module Code	Module Name in English	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
			hr/sem	hr/sem	hr/sem			
1	UOMU0206042	Thermodynamics 2	73	77	150	6.00	C	**Thermodynamics 1**
2	UOMU0206041	Oil Refining	101	49	150	6.00	C	
3	UOMU0206044	Properties of Engineering Materials	73	27	100	4.00	B	
4	UOMU0206046	Engineering Statistics	45	30	75	3.00	B	
5	UOMU0206045	Environmental Pollution and Industrial Safety	45	55	100	4.00	S	
6	UOMU0206043	Fluid Mechanics	87	38	125	5.00	C	
7	UOMU0000012	Arabic-2	45	5	50	2.00	S	
			469	281	750	30		

Level-3 / Semester-5

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

No	Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
1	UOMU0206051	Heat Transfer 1	73	77	150	6.00	C	
2	UOMU0206054	Energy Resources	73	52	125	5.00	C	
3	UOMU0206052	Internal Combustion Engines	73	77	150	6.00	C	
4	UOMU0206056	Engineering analysis	45	30	75	3.00	S	
5	UOMU0206053	Mass Transfer 1	73	77	150	6.00	C	
6	UOMU0206055	Electricity Basics	73	27	100	4.00	S	
			410	340	750	30		

Level-3 / Semester-6

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

No.	Module Code	Module Name in English	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
1	UOMU0206061	Mass Transfer 2	73	77	150	6.00	C	**Mass Transfer 1**
2	UOMU0206063	Reactor Design 1	69	66	125	5.00	C	
3	UOMU0206064	Power Plant Engineering	73	52	125	5.00	C	
4	UOMU0206065	Gas Technology	59	66	125	5.00	C	
5	UOMU0206066	Numerical Methods	45	30	75	3.00	B	
6	UOMU0206062	Heat Transfer 2	73	77	150	6.00	C	**Heat Transfer 1**
			382	368	750	30		

8 - Contact

Program Manager:

Ammar Abdulkadhim Fathi | Ph.D in Mechanical Engineering | Assistant Professor

Email : ammarabdulkadhim@uomus.edu.iq

Mobile No : +964 780 158 6849

Program Coordinator:

Hussein K. Halwas | Ph.D in Mechanical Engineering | Lecturer

Email: hussein.kadhim@uomus.edu.iq

Mobile No : +964 7841709669

Scientific Committee Members

1. *Prof. Dr. Haider Kareedi Rashid – Chair*
2. *Asst. Prof. Dr. Tayseer Sameer Jaaz – Member*
3. *Dr. Mujtaba Abdul-Kadhim Fleiḥ – Member*

Dean

Asst. Prof. Dr. Azher M. Abed

Technical Engineering College

Al Mustaqbal University

Babylon / Iraq