Program Catalogue | 2023-2024 | دليل البرنامج الدراسي

Al Mustaqbal University

جامعة المستقبل

First Cycle – Bachelor's Degree (B.Sc.) - Air Conditioning and Refrigeration Engineering Techniques

الدورة الأولى– بكالوريوس هندسة تقنيات التكييف والتبريد

Table of Contents | جدول المحتويات

1. Mission & Vision Statement

Vision Statement

The academic staff of the Air Conditioning and Refrigeration (AC) Engineering Techniques department at Al Mustaqbal University believes that providing high-quality technical education that makes the targeted return from the education process more efficient and distinguished by developing technical capabilities, critical thinking skills, social and personal skills, and work values in an ever-changing environment in both Mechanical and Air Conditioning Engineering. Small class sizes within the academic program foster a close working relationship between faculty and students in an informal and nurturing atmosphere that be a technical leader and innovator in providing high-quality educational programs and services, in a highly competitive global high-tech environment.

Mission Statement

The academic staff of the Air Conditioning and Refrigeration Engineering Techniques department pursues a multifaceted charge at Al Mustaqbal University. The Program seeks to provide Air Conditioning and Refrigeration students with the fundamental knowledge and beyond of the AC field, envisaging various employment capabilities and careers. This will prepare students with interests in specialized areas of AC systems such as mechanical maintenance of AC systems, AC electricity, design of AC parts, diagnosis of AC systems, and on for general mechanical engineering.

2. Program Specification

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

AC engineering program is designed to provide students with the skills to improve themselves by preparing them for a career in AC engineering. Students will learn how to manage of AC workshops and make all necessary service and maintenance. The curriculum consists of an AC maintenance and service with modern methods. Students will have the opportunity to know the principles of AC engineering and they will be prepared for careers in companies and programming teams dealing with the design, implementation and operation of information systems. Moreover, the students will be provided with the knowledge of electrical and computer control for AC systems.

Level 1 exposes students to the fundamentals of general mechanical engineering, suitable for progression to all programs within the mechanical power. Level 2 preparing student subject specialist modules at Levels 3 and 4. AC engineering graduate is therefore trained to appreciate how research informs teaching, according to the university and school mission statements.

3. Program Goals

to create leading AC engineers in the field of AC design and maintenance with the ability to diagnose, improve, build, and implement a solution to problems related to the areas of AC design, installation, and maintenance of air conditioners with quality and respect for the environment within an ethical and humane framework.

4. Student Learning Outcomes

- To maintain the electrical, electronic and mechanical systems that are part of the AC systems.
- To determine mechanical failures in AC systems, in accordance with the principles of thermodynamic operation using electronic diagnostic equipment.
- To optimize the mechanisms for energy consumption in the AC systems and the air quality, in response to the national and international environment quality standards.
- To participate in production systems in the AC industry seeking the optimization of resources in the manufacturing processes.
- To AC manufacturing processes using current technology for the manufacture of AC parts.
- To develop AC system design projects, using different thermal load estimation software.

- To implement quality and environmental standards in AC refrigerants processes, under national and international control schemes.
- Implement software embedded in engineering drawings and AC ducts and systems drawings.
- To develop the use of renewable energy in AC systems.
- Interpret and communicate adequately technical texts in the native language and in the English language for their use in the field of AC Engineering.

Outcome 1
Understanding of allied knowledge
Graduates will be able to maintain the electrical, electronic, and mechanical systems that are part of the AC systems.

Outcome 2
Oral and Written Communication
Graduates will be able to formally communicate the results of AC investigations using both oral and written communication skills.

Outcome 3
Technical and cognitive skills
Graduates will be able to collect, analyze, process, summarize data and deal with various AC engineering skills like (testing, debugging, word processing, data visualization, ..)

Outcome 4
Critical thinking and analytical skills
Graduates will be able to identify engineering problems and try to solve them with approaches based on logical and critical thinking using modeling, designing and simulation methods.

Outcome 5
Appropriate research tools and techniques
Graduates will be able to design install, and maintain related AC systems depending on programming software, AC standards, and considering the weather and environmental conditions.

Outcome 6
Communication and IT skills
Graduates will be able to use engineering drawing software (like AutoCAD), AC software for thermal load estimation, and other mechanical design desktop software.

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 to 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. Academic Staff

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6. Credits, Grading and GPA

Credits

Al Mustaqbal 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 = [(1^{st} module score x ECTS) + (2^{nd} module score x ECTS) + ……]/240

7. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 30 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UOMU021011	Mathematics	87	153	240	8.00	
UOMU021012	Engineering Drawing	88	92	180	6.00	
UOMU021013	Workshops	116	124	240	8.00	
UOMU021014	Engineering Materials	60	90	150	5.00	
UOMU021015	English 1	59	31	90	3.00	

Semester 2 | 30 ECTS | 1 ECTS = 30 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UOMU021026	MATLAB	88	32	120	4.00	
UOMU021027	Electrical Engineering	116	94	210	7.00	
UOMU021028	Engineering Mechanics	87	123	210	7.00	UOMU021011
UOMU021029	Thermodynamics 1	144	96	240	8.00	
UOMU0210210	Humans Rights and Democracy	30	30	60	2.00	
UOMU0210211	Arabic	30	30	60	2.00	
UOMU0210212	Computer Principles	88	32	120	4.00	

Semester 3 | 30 ECTS | 1 ECTS = 30 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UOMU0210313	Advanced Mathematics	102	78	180	6.00	UOMU021011
UOMU0210314	Mechanical Drawing	116	64	180	6.00	UOMU021012
UOMU0210315	Fluid Mechanics	144	96	240	8.00	
UOMU0210316	Thermodynamics 2	158	142	300	10.00	UOMU021029

Semester 4 | 30 ECTS | 1 ECTS = 30 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UOMU0210417	Fundamentals of Air Conditioning and Refrigeration	144	156	300	10.00	UOMU021029
UOMU0210418	Strength of Materials	116	124	240	8.00	UOMU021028
UOMU0210419	Computer Applications 1	88	92	180	6.00	
UOMU0210420	English 2	86	94	180	6.00	UOMU021015
UOMU0210421	Summer Training 1	144	156	300	10.00	UOMU021029

Semester 5 | 30 ECTS | 1 ECTS = 30 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UOMU0210522	Engineering and Numerical Analysis	87	33	120	4.00	UOMU0210313
UOMU0210523	Computer Applications 2	88	32	120	4.00	UOMU0210419
UOMU0210524	Theory of Machine and Vibrations	116	4	120	4.00	UOMU021028, UOMU0210418
UOMU0210525	Heat Transfer	144	96	240	8.00	UOMU0210315, UOMU0210316
UOMU0210526	Air Conditioning and Refrigeration Systems	144	156	300	10.00	UOMU0210417

Semester 6 | 30 ECTS | 1 ECTS = 30 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UOMU0210627	Mechanical Design	88	62	150	5.00	UOMU0210418
UOMU0210628	Maintenance of Air Conditioning System	144	156	300	10.00	UOMU0210417
UOMU0210629	English 3	44	46	90	3.00	UOMU0210420
UOMU0210630	Air Conditioning Systems Drawing	116	94	210	7.00	UOMU0210314, UOMU0210417
UOMU0210631	Electrical and Electronic Engineering	88	62	150	5.00	UOMU021027

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UOMU0210632	Summer Training 2	88	62	150	5.00	UOMU0210418

Semester 7 | 30 ECTS | 1 ECTS = 30 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UOMU0210733	Project	129	51	180	6.00	UOMU0210417
UOMU0210734	Air Conditioning System Design	144	156	300	10.00	UOMU0210417
UOMU0210735	Power Plants	144	36	180	6.00	UOMU021029
UOMU0210736	Computer Applications 3	88	62	150	5.00	
UOMU0210737	Industrial Engineering Management	45	45	90	3.00	

Semester 8 | 30 ECTS | 1 ECTS = 30 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
UOMU0210838	Refrigeration Systems	158	142	300	10.00	UOMU0210417
UOMU0210839	Renewable Energy	158	142	300	10.00	UOMU0210316
UOMU0210840	Professional Ethics	30	30	60	2.00	
UOMU0210841	English 4	30	30	60	2.00	UOMU0210629
UOMU0210842	Control and Measurements	116	64	180	6.00	UOMU0210526

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