



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



University of Warith AL-Anbiyaa

**Academic Program,
Curriculum and Course
Description for the
Department of Refrigeration
and Air Conditioning
Engineering**

2024 - 2025



Academic Program Description Form

University Name: University of Warith AL-Anbiyaa

Faculty/Institute: College of Engineering

Scientific Department: Air Conditioning and Refrigeration Techniques

Academic or Professional Program Name:

Final Certificate Name:

Academic Degree System:

Description Preparation Date: 2024/12/1

File Completion Date: 2024/12/1

Signature:

Head of Department Name: Dr. Mohammed Hassan

Date: 2024/12/1

Signature:

Scientific Associate Name: Dr. Hasan T. Hashig

Date: 2024/12/1

The file is checked by: Dr. Salam Al-Rbeawi

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance

Department:

Date: 2024/12/1

Signature:

Approval of the Dean

Dr. Salam Al-Rbeawi

1. Program Vision

The faculty members of the Department of Refrigeration and Air Conditioning at the College of Engineering at Warith Al-Anbiya University work to provide high-quality technical education that makes the targeted return from the educational process more efficient and distinctive by developing technical capabilities, critical thinking skills, social and personal skills, and work values in an ever-changing environment in Refrigeration and Air Conditioning Engineering. To form a close working relationship between faculty members and students in an informal and caring atmosphere to be a technical leader and innovator in providing high-quality educational programs and services, in a highly competitive global high-tech environment.

2. Program Mission

The Refrigeration and Air Conditioning Engineering program is designed to provide students with the skills needed to improve their employability by preparing them to work in refrigeration and air conditioning engineering. Students learn how to manage refrigeration and air conditioning workshops and perform all necessary services and maintenance. The curriculum includes the design and maintenance of refrigeration and air conditioning systems using modern methods. Students will have the opportunity to learn the principles of refrigeration and air conditioning technology and will be prepared to work in companies and programming teams that deal with the design, implementation and operation of heating, ventilation and air conditioning systems.

Level I: introduces students to the basics of general mechanical engineering and is suitable for progression to all programs in the field of mechanical energy including thermal energy. In addition, students will

be provided with mechanical, electrical and computer control knowledge of refrigeration and air conditioning systems.

Level II: Prepares the student for specialized topics in levels III and IV. Therefore, students of refrigeration and air conditioning engineering are trained to search for academic information, in line with the university and college trends.

3. Program Objectives

- 1- Preparing and graduating a technical engineering cadre that achieves the main technical and cognitive requirements to be a high-quality engineering and technical cadre in the field of refrigeration and air conditioning.
- 2- Establishing the principle of participation in society to spread the culture of technical education and its applications.
- 3- Graduating scientific teams with confident skill and understanding in the field of calculating and analyzing thermal loads as well as in manufacturing, design, control and maintenance activities of related devices.
- 4- Organizing training and qualification courses by a competent cadre with the participation of department students to engage in the labor market.
- 5- Strengthening the scientific and administrative relationship with the corresponding scientific and engineering colleges as well as ministries, industrial companies and other relevant institutions regarding teaching needs, rehabilitation and development of education programs.
- 6- Developing and developing all the necessary scientific and administrative plans and curricula to achieve the above paragraphs as required and following up on the feedback for the work of the plan or curriculum department.

4. Program Accreditation

Work is underway to adopt the requirements of the Bologna process to achieve and ensure the quality of learning in the Department of Refrigeration and Air Conditioning Engineering Technology, in coordination with the corresponding college, which is the College of Engineering Technology at the Middle University/Baghdad.

5. Other External influences

There are no external influences from other parties on the department.

However, there is an academic twinning between our department and the oil and gas engineering department at the University of Technology in Baghdad.

6. Program Structure (Annual System)

Program Structure	Number of Courses	Credits hours	Percentage	Reviews
Institution Requirements	5	17	8%	Basic course
College Requirements	7	44	13%	Basic course
Department Requirements	30	136	78%	Basic Crouse
Summer Training	2 months			
Other				

- This can include notes whether the course is basic or optional

6, Program Structure (Bologna process)

Program Structure	Number of Courses	Credits hours	Percentage	Reviews
Institution Requirements	5	17	8%	Basic course
College Requirements	7	44	13%	Basic course

Department Requirements	31	201	83%	Basic Course
Summer Training	2 months			
Other				

- This can include notes whether the course is basic or optional

7. Program Description

Year / Level	Crouse Code	Crouse Name	Credit Hours	
			theoretical	Practical
Stage one First Course	ENG 100	Mathematics	6	
	ENG 101	Engineering Drawing	2	4
	ENG 102	Workshops		8
	MPAC103	Engineering Materials	4	
	UOW 104	English	3	
Stage one Second Course	MPAC106	Electrical Engineering	4	4
	ENG 107	Engineering Mechanics	6	
	MPAC108	Thermodynamics 1	6	4
	UOW 109	Humans Rights and Democracy	2	
	UOW 110	Arabic I	2	
	UOW 111	Computer principles	2	2
Stage Two First Course	MPAC 200	Advanced Mathematics	6	
	MPAC 201	Mechanical Drawing	2	6
	MPAC 202	Fluid Mechanics	4	4
	MPAC 203	Thermodynamics 2	6	4
	UOW 204	The crimes of the Baath regime in Iraq	2	
Stage Two Second course	MPAC205	Fundamentals of Air Conditioning and Refrigeration	6	4
	MPAC206	Strength of Materials	4	4
	MPAC207	Matlab	2	2
	UOW 208	English 2	3	
	MAPAC 209	Arabic 2	2	
	MPAC210	Summer Training 1	-	-
Third Stage	ENG 300	Engineering and Numerical Analysis	4	
	MPAC301	Computer Applications 2	1	2
	MPAC302	Theory of Machine and Vibrations	3	
	MPAC303	Heat Transfer	3	2

Fourth Stage	MPAC304	Air Conditioning and Refrigeration systems	2	1
	MPAC305	Mechanical Design	3	
	MPAC307	Maintenance of Air Conditioning systems	1	3
	MPAC308	English 3	2	
	MPAC309	Air Conditioning systems Drawing	1	2
	MPAC311	Electrical and Electronic Engineering	3	2
	MPAC310	Summer Training 2	-	-
	ENG 400	Project	6	
	MPAC401	Air Conditioning System Design	2	2
	MPAC402	Power Plants	3	2
	MPAC404	Computer Applications 3	1	2
	MPAC405	Industrial Engineering Management	3	
	MPAC406	Refrigeration Systems	3	2
	MPAC407	Renewable Energy	3	
	MPAC408	Professional Ethics	2	
	MPAC409	English 4	2	
	MPAC410	Control and Measurements	3	1

8. Expected Learning Outcomes of the Program		
Knowledge		
1.	Maintenance of electrical, electronic and mechanical systems that are part of air conditioning systems	Learning Outcomes(1)
2.	Identify mechanical failures in air conditioning systems according to the principles of thermodynamic operation using electronic diagnostic devices.	

<ol style="list-style-type: none"> 3. Improving energy consumption mechanisms in air conditioning and air quality systems, in response to national and international environmental quality standards. 4. Participating in production systems in the air conditioning industry in an effort to optimize resources in manufacturing processes. 5. Air Conditioner Manufacturing Processes through the use of current technology to manufacture air conditioner parts. 6. Develop air conditioning system design projects, using various convection estimation software. 7. Implementation of quality and environmental standards in air conditioning refrigeration processes, within the framework of national and international monitoring plans. 8. Implementation of programs included in engineering drawings, drawings of channels and air conditioning systems. 9. Developing the use of renewable energy in air conditioning systems. <ul style="list-style-type: none"> • Interpret and communicate technical texts appropriately in the mother tongue and in English for use in the field of refrigeration and air conditioning engineering. 	
Skills	
<ol style="list-style-type: none"> 1. – Installation and operation of air conditioning and freezing systems. 2. – Managing maintenance and repair complexes for various air conditioning and freezing systems and units. 3. – Dealing with modern inspection and malfunction diagnostic devices and equipment in the field of specialization. 1. The possibility of developing air conditioning and freezing systems and achieving specific goals 2. Ability to make updates to improve the performance of air conditioning and freezing units 	<p>Learning Outcome (2)</p>

3. Ability to perform corrective calculations for the manufacture of devices and systems in the field of specialization	
values	
Learning Outcomes (1) Group/Team Leadership	Learning outcomes (3) and (4)
<p>Graduates will be able to motivate themselves, collaborate effectively with other professionals from diverse disciplines, backgrounds, and interests to solve problems, operate clearly in complex situations under pressure, and demonstrate knowledge and commitment to following safety procedures for themselves and others.</p> <p>Learning Outcomes (2)</p> <p>Personal Professional Development</p> <p>Graduates will be able to make their own decisions, plan and solve problems, and stay informed about professional matters.</p>	

8. Evaluation Method

- A- Midterm and final exams.
- B- Short exams (Quiz).
- C- Writing Scientific Reports.
- D- Homework.
- H- Scientific Seminars.
- C- Graduation Project Discussion Committees.

9. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements / Skill (if applicable)	Number of the teaching staff	
	General	Special		Staff	Lecturer
Lecturer	Mechanical Engineering	Air Conditioning and Freezing / power		1	
Lecturer Doctor	Mechanical Engineering	Fluid mechanics		1	
Lecture	Mechanical Engineering	Motion Systems Engine		1	
Lecture Doctor	Mechanical Engineering	Power Mechanics		1	
Lecture Doctor	Mechanical Engineering	Refrigeration and Air Conditioning Engineering		1	
Assistant Professor Doctor	Mechanical Engineering	Power Mechanics		1	
Lecture Doctor	Industrial Engineering	Intelligent Manufacturing Systems		1	
Assistant Professor Doctor	Mechanical Engineering	Power Mechanics		1	
Assistant Lecture	Mechanical Engineering	Power Mechanics		2	
Assistant Lecture	Electrical Engineering	Electronics		1	
Assistant Lecture	Computer Science	Artificial Intelligence		1	
Assistant Lecturer	Mechanical Engineering	Applied Mechanics		1	
Lecturer	Mechanical Engineering	Power Mechanics			1

Assistant Professor, Doctor	Electrical and Electronics Engineering,	Communications Engineering			1
Assistant Lecture	Mechanical Engineering	Power Mechanics			2
Lecturer Doctor	Mechanical Engineering	Power Generation			1
Assistant Professor Doctor	Electromechanical Engineering	Energy Electromechanics			1
Lecture	Polymer Engineering	Applied Mechanics			1
Assistant Lecture	Environmental Engineering	Environmental Engineering			1
Assistant Professor, Doctor	Mechanical Engineering	Applied Mechanics			1
Assistant Professor, Doctor	Mechanical Engineering	Power Mechanics			1
Assistant Lecturer	Power Mechanics	Thermal Engineering Technology			1
Assistant Lecturer	Mechanical Engineering	Mechanical Engineering			1
Assistant Lecturer	Private Law	Civil Law			1

Professional Development

Mentoring new Faculty members

The Department of Refrigeration and Air Conditioning Technologies follows a structured orientation process for new, visiting, and prospective faculty members. This begins with a formal reception and introduction to the institution's policies, vision, and mission, followed by an overview of the department's administrative and academic structure. This is followed by introductory meetings with faculty and administrative staff, and the provision of an orientation guide detailing academic and educational procedures. Lecture schedules and study plans are also provided, along with orientation to the department's academic facilities and technical workshops. The process concludes with the appointment of an academic advisor or coordinator to follow up on their adaptation and provide the necessary support during their initial period of joining.

Professional development of faculty members

The plan relies on developing faculty members' competencies through recurring programs that include workshops and training courses on effective teaching strategies, active learning, and e-learning. The plan enhances course design skills and content updates in line with labor market requirements, with a focus on developing tools for assessing and analyzing learning outcomes to improve the quality of education. The plan also includes activities for continuing professional development, such as conference attendance, scholarly publishing, and research collaborations. Implementation of this plan is monitored through periodic evaluations of faculty performance and the provision of constructive feedback that contributes to raising the academic and professional level within the institution.

10. Acceptance Criterion

- A- Admission requirements to the college:
- B- Adoption of admission requirements for students according to the instructions issued by the Ministry of Higher Education and Scientific Research (Central Admission)
- C- To be medically fit for the specialization applied for
- D- Admission requirements to the scientific department.
- C- Selecting the student's desire from more than one desire arranged according to preference
- H- High school graduation rate
- K- The capacity of the scientific department.

11. The most important sources of information about the program

1. Sources approved by international universities
2. Twinning with Middle Technical University
3. Local trends
4. Market needs
5. Studies and surveys
6. Specialized seminars and workshops with beneficiaries
7. Internet (World Wide Web)

12. Program development plan

The focus in the Department of Refrigeration and Air Conditioning Engineering is on continuous improvement. The department always seeks to improve the scientific and administrative process and overcome all difficulties and obstacles that hinder the educational program by developing human resources to develop the personality.

The following procedures explain the steps implemented or in the process of implementation in this field:

1. Continuous improvement and development of faculty members through training programs and workshops inside and outside the department and the university.
2. Increasing extracurricular activities such as holding conferences, scientific seminars, personal and sports creativity locally, regionally and internationally.
3. Encouraging faculty members to obtain the highest scientific and administrative ranks.
4. Providing specialized software in refrigeration and air conditioning engineering and the necessary computers for this, along with Internet lines, for all instructors.

Curriculum Skills Chart

Please indicate the boxes corresponding to the individual learning outcomes from the program
being evaluated

Learning Outcomes Required from the Program																fundamenta l Or optional	Course Name	Cours e Code	Ye ar Lo e
General and Transferable Skills) Others related to employability and personal development)				Thinking skills				Subject-specific skills				Knowledge and Understanding							
D 4	D 3	D 2	D 1	C 4	C 3	C 2	A 1	B 4	B 3	B 2	B 1	A 4	A 3	A 2	A 1				
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	Essential	rights Human	MPAC110	Sta Fir t
√	√	√	√	√	√	√	√	√	√	√	√			√	√	assistant	Math 1	MPAC100	
			√			√	√			√	√				√	elective	Calculator Apps 1	MPAC112	
	√	√	√		√	√	√		√	√	√		√	√	√	Essential	Engineering Drawing	MPAC101	
		√	√	√	√	√	√		√	√	√	√	√	√	√	Essential	Mechanics	MPAC108	
	√	√	√	√	√	√	√		√	√	√	√	√	√	√	Essential	Electricity Technology	MPAC107	
	√	√	√	√	√	√	√		√	√	√	√	√	√	√	Essential	modulus	MPAC102	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	Essential	Materials Engineering	MPAC103	

√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	Essential	Thermodynamics 1	MPAC109
√	√	√	√													assistant	English	MPAC104
√	√	√	√													Essential	Arabic Language	MPAC111

Curriculum Skills Chart			
Please indicate the boxes corresponding to the individual learning outcomes from the program being evaluated			
Learning Outcomes Required from the Program	fundamental	Course Code	Year/

General Skills and Transferable Skills Others related to employability and personal development)		Thinking skills					Subject-specific skills					Knowledge and Understanding					Or optional	Course Name		Level
D4	D3	D2	D1	C4	C3	C2	A1	B4	B3	B2	B1	A4	A3	A2	A1					
√	√	√	√	√	√	√	√		√	√	√		√	√	√			Math 2	MPAC200	Phas II
		√	√			√	√			√	√			√	√			Calculator Apps 2	MPAC207	
√	√	√	√	√	√	√	√		√	√	√	√	√	√	√			Moa D Resistance	MPAC206	
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√			Thermodynamics 2	MPAC203	
		√	√	√	√	√	√		√	√	√	√	√	√	√			Mechanical Drawing	MPAC201	
√	√	√	√	√	√	√	√		√	√	√	√	√	√	√			Fluid Mechanics	MPAC202	
√	√	√	√	√	√	√	√		√	√	√	√	√	√	√			Refrigeration & Air Conditioning 1	MPAC205	
√	√	√	√															English 2	MPAC208	

√	√	√	√	√	√	√	√					√	√	√	√		Baath Party Crimes in Iraq	
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Learning Outcomes Required from the Program																fundamental Or optional	Course Name
General and transferable skills (other skills related to employability and personal development)				Thinking skills				Subject-specific skills				Knowledge and Understanding					
D4	D3	D2	D1	C4	C3	C2	A1	B4	B3	B2	B1	A4	A3	A2	A1		
		√	√	√	√	√	√		√	√	√		√	√	√		Applications Calculator 3
		√	√			√	√		√	√	√			√	√		Engineering and numerical analysis
√	√	√	√	√	√	√	√		√	√	√		√	√	√		Electrical and Electronic Engineering
		√	√		√	√	√				√			√	√		Theory of Machines and Vibrations
√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		Heat Transfer

√	√	√	√		√	√	√		√	√	√	√	√	√	√		Design Mechanical
√	√	√	√	√	√	√	√		√	√	√	√	√	√	√		Drawing of Refrigeration and Air Conditioning Systems
√	√	√	√	√	√	√	√		√	√	√	√	√	√	√		Refrigeration & Air Conditioning Maintenance
√	√	√	√	√	√	√	√		√	√	√	√	√	√	√		Refrigeration & Air Conditioning 2
√	√	√	√														English 3