

	Ministry of Higher Education and Scientific Research - Iraq University of Warith Al-Anbiyaa College of Advanced Technologies Department of Refrigeration and Air Conditioning Techniques Engineering	
---	--	---

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Air Conditioning System Design		Module Delivery	
Module Type	C		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MPAC401			
ECTS Credits	10			
SWL (hr/sem)	250			
Module Level	4	Semester of Delivery		1
Administering Department	BSC-HVAC		College	Advanced Technologies
Module Leader	Ihab Omar		e-mail	ihab.om@uowa.edu.iq
Module Leader's Acad. Title	LECTURE		Module Leader's Qualification	PhD
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	31/8/2026		Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	MPAC304	Semester	L3,S1
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Study the type of all types of refrigeration system. 2. This course provides information on air conditioning system design and gives a good understanding of the techniques, concepts, and methods of the HVAC system design. 3. Introduces theories and operations of heating and air conditioning system. Includes design of HVAC system
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Learn how to select the suitable air terminal device and the indoor air distribution behavior 2-Study and learn some important concepts of air distribution such as duct layout, Fan, AHU, etc. 3-Work on the advanced process in the HVAC system 4-Learn about the different types of air conditioning system 5-Learn some rules of piping systems and accessories
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Air distribution systems 2. Room air distribution, conditioned room air distribution 3. Refrigeration and air conditioning equipment classification 4. Piping's systems and accessories. 5. Advanced applications on psychometric charts. 6. Conventional air condition system(mechanical and electrical components)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Assessment is based on hand-in assignments, written exams, Quizzes, reports, Practical testing, and Online testing.
-------------------	---

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	144	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	10
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	106	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	11
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	250		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 11	
	Assignments	5	10% (10)	3,5,7,10,13	
	Projects / Lab.				
	Report	2	10% (10)	8, 13	
Summative assessment	Midterm Exam	2 hr	20% (20)	7	
	Final Exam	3hr	50% (50)	15	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Air distribution systems, zoning, Air –conditioning layout systems.

Week 2	Room air distribution, conditioned room air distribution systems, room air distribution requirements, air outlets (types) and selection. Air –handling units, fan-coil units (components and selection), system resistance in series and parallel.
Week 3	Fans (types ,designs ,selection ,calculation and connection)
Week 4	Air filtration (types, application, selection and its relations with conditioned room function. The noise in air conditioning systems. (Sources and treatments by using ducts silencers and plenum), air outlet selection with recommended noise.
Week 5	Advanced applications on psychometric charts.
Week 6	Advanced applications on psychometric charts.
Week 7	Piping's systems and accessories (open and closed system), (two, three, four pipe system) comparative study and design and applications.
Week 8	Evaporative cooling systems, application and design of (air cooler, cooling tower, and air washers), psychometric chart. Air conditioning systems (types and selection) and its relation with occupant's activities..
Week 9	All air systems, features, advantages, disadvantages, comparative study with other systems, and psychometric chart.
Week 10	Single zone system (variable volume constant temperature and variable temperature constant volume), comparative study (cost and performance), psychometric chart.
Week 11	Dual conduit system, multi zone system comparative study, psychometric chart. Air –water systems (types, features, advantages, disadvantages, comparative study with other systems, psychometric chart.
Week 12	Induction unit systems (features, types, advantages and disadvantages). All –water systems, advantages, disadvantages, performance and applications.
Week 13	Fan –coil unit systems ,and primary air and fan –coil system (comparative study) Dx – systems, package system, and applications.
Week 14	Energy conservation in air conditioning systems. Heat pump system for air conditioning system.
Week 15	Evaluations and commercial analysis for air conditioning systems.

كلية التقنيات الحديثة
COLLEGE OF ADVANCED TECHNOLOGIES

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الأسبوعي للمختبر

	Material Covered
Week 1	Project
Week 2	
Week 3	

Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- "REFRIGERATION AND AIR CONDITIONING " By RAMESH CHANDRA ARORA 2-"Heating, Ventilating, and Air Conditioning" Analysis and Design By Faye C. McQuiston, Jerald D. Parker, and Jeffrey D. Spitler. Sixth Edition	yes
Recommended Texts	"REFRIGERATION AND AIR CONDITIONING" By W. F. Stoecker, and J. W. Jones	Yes
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group	A - Excellent	امتياز	90 - 100	Outstanding Performance

(50 - 100)	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: Marks 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.



استاذ المادة. ايهاب عمر
التاريخ: 31-8-2026

العميد ا.م.د علي باسم



رئيس القسم: ا.م.د محمد حسن عبود

التاريخ : 31-8-2026

