	وزارة التعليم العالي والبحث العلمي - العراق جامعة وارث الأنبياء كلية الهندسة قسم تقنيات التبريد والتكييف	

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Air Conditioning Systems Drawing			**Module Delivery**	
Module Type	C			☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MPAC308				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level	3		**Semester of Delivery**	2	
Administering Department	Refrigeration and Air Conditioning Techniques.		**College**	Engineering	
Module Leader	Zaid Riyadh		**e-mail**		
Module Leader's Acad. Title	Assistant teacher		**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	31 / 08/2025		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	MPAC 201 MPAC 206	**Semester**	3, 4
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To enable and qualify the student to understand the architectural plans and their sections. 2. To draw and understand the mechanical layouts of the ducting network for ventilation. 3. To provide the ability to draw the piping network of the central air conditioning systems with all the necessary accessories of valves, fittings and sensors. 4. To draw the detail drawings of the air conditioning devices of fan coil units, chillers, boilers, air handling units, and cooling towers. 5. To design VRF systems for selective AC companies. 6. To understand the electrical and control diagrams of the air conditioning systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Making site survey and drawing the architectural plans. • Estimate the cooling load of buildings by Rule of Thumb method. • Estimate the required ventilation of buildings by Rule of Thumb method. • Using the Duct Sizer software to design the ducting network. • Drawing the ducting network by AutoCAD MEP or Revit software. • Selection of chillers, boilers, AHU's, package units, fan coils and cooling towers of deferent brand. • Using the Pipe Sizer software to design the piping network of the air conditioning system. • Drawing the piping network by AutoCAD MEP or Revit software. • Designing the VRV/VRF system by the selection software of some manufacturer brands.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Drawing Plans Walls, columns, doors, windows, stairs, shafts, elevation. [9 hrs] Part B – Ducting Drawing Load estimation, specify ventilation, units' selection, duct design and drawing. [30 hrs] Part C – Piping Drawing Chillers, boilers, pumps selection, piping design and drawing, VRF system drawing. [30 hrs] Part D – Electrical Drawing

	Chillers, boilers, pumps, VRF system electrical drawing. [21 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises. This will be achieved through classes, interactive tutorials and by considering some simple real projects as well as site visiting for finished and ongoing projects.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	116	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	8
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	59	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	5% (8)	3,8,12,13	LO # 1, 5, 8, 9
	Assignments	8	15 % (12)	2,4,5,8,12, 13,14,15	LO # 1-9
Summative assessment	**Midterm Exam**	3 hr.	30% (30)	9	LO # 1-9
	Final Exam	3 hr.	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Making site survey
Week 2	Draw architectural plans
Week 3	Draw elevation plans
Week 4	Cooling load estimation
Week 5	Specify the required ventilation
Week 6	Package units, fan coil units and AHUs selection

Week 7	Design ducting network by Duct Sizer
Week 8	Drawing ducting network
Week 9	Midterm Exam
Week 10	Chillers, boilers, cooling towers and pumps selection
Week 11	Design piping system by Pipe Sizer
Week 12	Drawing the piping system
Week 13	VRV/VRF system design and drawing
Week 14	Drawing the electrical and control diagram of central air conditioning system
Week 15	Drawing the electrical and control diagram of VRV/VRF systems

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. 2021 ASHRAE handbook. Fundamentals 2. Principles of heating, ventilating, and air conditioning: a textbook with design data based on the 2021 ASHRAE handbook--Fundamentals 3. Design manual for heating, ventilation and air conditioning with coordinated standard details: Lee Kendrick, Julian C. Gonzalez,1986	No

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: 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.