

Course Description Form

1. Course Name:					
Air Conditioning System Design/ 4 th					
2. Course Code:					
MPAC401					
3. Semester / Year:					
(Annual System) (2024-2025)					
4. Description Preparation Date:					
The beginning of the academic calendar for the year (2024–2025)					
5. Available Attendance Forms:					
Theoretical and Practical Classes					
6. Number of Credit Hours (Total) / Number of Units (Total)					
(60 hrs. theoretical + 60 hrs. practical)120 hours /6 units					
7. Course administrator's name (mention all, if more than one name)					
Name: Ihab Omar Email: ihab.om@uowa.edu.iq					
8. Course Objectives					
Course Objectives		<ul style="list-style-type: none"> a) Helping the student understand the properties of the mixture of air and vapor. b) Helping the student to understand the behavior of the air and vapor mixture. c) Helping the student to understand and use the laws for calculating the properties of air and vapor mixtures. d) Helping the student understand, use and design fans. e) Helping the student understand, use and design water pipes f) Helping the student understand the parts of the air handling unit, air purification, and devices used. 			
9. Teaching and Learning Strategies					
Strategy		<ul style="list-style-type: none"> 1- Lectures and illustrations: Data Show 2- Practical tests using laboratory equipment 3- Multimedia using the e-learning system 4- Giving the lecture, answering students' questions, and discussing with the students aspects that are not clear to them. 			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	2 theoretical + 2 practical	The student understands: 1. Air distribution 2. zoning air 3. Duct layout	Air handling and distribution systems ,zoning, Air –conditioning layout systems ,duct sizing	A theoretical and a practical lecture	Weekly exams

3-4	2 theoretical + 2 practical	The student understands: 1. Room air distribution 2. Air distribution requirements 3. Air outlets	Room air distribution, conditioned room air distribution systems, room air distribution requirements, air outlets (types), calculation and selection, design.	A theoretical and a practical lecture	Weekly exams, pre and post questions
4-6	3 theoretical + 2 practical	The student understands: 1. Air –handling units 2. Components	Air –handling units, fan-coil units (components, calculation, design and selection) system resistance in series and parallel.	A theoretical and a practical lecture	Weekly exams, and post questions
6-7	2 theoretical + 2 practical	The student understands: 1. Fans 2. types 3. designs 4. selection	Fans (types ,designs ,selection ,calculation and connection in series and parallel point the working point by system and characteristics curves.	A theoretical and a practical lecture	Weekly exams, and post questions
8	2 theoretical + 2 practical	The student understands: 1. Air filtration 2. types 3. function 4. selection	Air filtration (types, application, selection and relations with conditioned room function.	A theoretical and a practical lecture	Weekly exams, and post questions
9	2 theoretical + 2 practical	The student understands: 1. noise in air conditioning systems 2. Sources 3. treatments	The noise in air conditioning systems. (Sources and treatments by using ducts silencers and plenum), air outlet selection with recommended noise.	A theoretical and a practical lecture	Weekly exams, and post questions
10-12	2 theoretical + 2 practical	The student understands: 1. psychometric charts applications	Advanced applications of psychometric charts.	A theoretical and a practical lecture	Weekly exams, and post questions
13-14	2 theoretical + 2 practical	The student understands: 1. Piping's systems 2. accessories 3. types 4. design	Piping's systems and accessories (open and closed system), (two, three, four pipe system) comparative study and design and applications.	A theoretical and a practical lecture	Weekly exams, and post questions
15	2 theoretical + 2 practical	The student understands: 1. Evaporative cooling 2. application	Evaporative cooling system application and design of cooler, cooling tower, and washers), psychometric chart.	A theoretical and a practical lecture	Weekly exams, and post questions
16	2 theoretical + 2 practical	The student understands: 1. Air conditioning systems	Air conditioning system (types and selection) and relation with occupant activities.	A theoretical and a practical lecture	Weekly exams, and post questions
17-18	2 theoretical + 2 practical	The student understands: 1. All air systems	All air systems, design, features, advantages,	A theoretical and a practical lecture	Weekly exams, and post questions

			disadvantages, comparative study with other system and psychometric chart.	lecture	questions
19	2 theoretical + 2 practical	The student understands: 1. Air conditioning systems	Single zone system (variable volume constant temperature and variable temperature constant volume), comparative study (cost and performance), psychometric chart.	A theoretical and a practical lecture	Weekly exams, and post questions
20	2 theoretical + 2 practical	The student understands: 1. Dual conduit systems	Dual conduit system, multi-zone system comparative study, psychometric chart.	A theoretical and a practical lecture	Weekly exams, and post questions
21	2 theoretical + 2 practical	The student understands: 1. Air –water systems	Air –water systems (types, design, features, advantages, disadvantages, comparative study with other system psychometric chart.	A theoretical and a practical lecture	Weekly exams, and post questions
22	2 theoretical + 2 practical	The student understands: 1. Induction unit systems	Induction unit systems (study, design, types, and controls).	A theoretical and a practical lecture	Weekly exams, and post questions
23	2 theoretical + 2 practical	The student understands: 1. All –water systems	All –water systems, comparative performance, design and applications.	A theoretical and a practical lecture	Weekly exams, and post questions
24	2 theoretical + 2 practical	The student understands: 1. Fan –coil unit	Fan –coil unit systems, a primary air and fan –coil system (comparative study, design and control)	A theoretical and a practical lecture	Weekly exams, and post questions
25	2 theoretical + 2 practical	The student understands: 1. Dx –systems 2. package system	Dx –systems, package system, control and applications.	A theoretical and a practical lecture	Weekly exams, and post questions
26	2 theoretical + 2 practical	The student understands: 1. Energy conservation	Energy conservation in conditioning systems.	A theoretical and a practical lecture	Weekly exams, and post questions
27	2 theoretical + 2 practical	The student understands: 1. Heat recovery systems	Heat recovery systems.	A theoretical and a practical lecture	Weekly exams, and post questions
28	2 theoretical + 2 practical	The student understands: 1. Heat pump system	Heat pump system for air conditioning system.	A theoretical and a practical lecture	Weekly exams, and post questions
29-30	2 theoretical + 2 practical	The student understands: 1. Evaluations air conditioning systems 2. Analysis air conditioning systems	evaluations and commercial analysis for air conditioning systems.	A theoretical and a practical lecture	Weekly exams, and post questions

11. Course Evaluation

1. Daily oral questions.
2. Discussion and dialogue with students

3. Attendance
4. Bi-monthly oral exams.
5. Monthly written tests.
6. Semester exam (first semester + second semester)
7. Final annual exam.

12. Learning and Teaching Resources

Required textbooks (curricular book any)	"ASHRAE fundamentals Handbook for air conditioning Refrigeration", SI, 2013.
Main references (sources)	Wilbert F., Stoecker and Lekold W. Jones, " Refrigeration and Air condition McGraw-Hill, 1982 .
Recommended books and references (scientific journals, reports...)	1- Dr. Abdul Hadi N. Khalifa, Refrigeration and Air conditioning Engineering Dept. Engineering Technical College 3rd year – refrigeration and Air conditioning Course,2015. 2- Nihal E Wijesundera, principles of heating ventilation and air conditioning worked examples
Electronic References, Websites	