

FOURTH STAGE

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| Number of units 8 | T 5 | Pr 2 | Th 3 | Number of weekly hours | Annual System 30 weeks | Al-Esra'a University College Department: Engineering of Refrigeration and Air Conditioning Technologies |
| | | | | Air conditioning Systems | | Fourth stage |
| <u>Course Objective</u> | | | | | | |
| To study the types and design of air conditioning systems | | | | | | |

| Week | Topic | Lab. Experiment Assignments | Notes |
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| 1-2 | Air handling and distribution systems ,zoning, Air –conditioning layout systems ,duct sizing ... | Design projects for different types of air conditioning systems | |
| 3-4 | Room air distribution, conditioned room air distribution systems, room air distribution requirements, air outlets (types), calculation and selection, design. | | |
| 5 | Air –handling units, fan-coil units (components, calculation, design and selection) system resistance in series and parallel. | | |
| 6-7 | Fans (types ,designs ,selection ,calculation and connection in series and parallel point the working point by system and characteristics curves | | |
| 8 | Air filtration (types, application, selection and its relations with conditioned room function. | | |
| 9 | The noise in air conditioning systems. (Sources and treatments by using ducts silencers and plenum), air outlet selection with recommended noise. | | |
| 10-12 | Advanced applications on psychometric charts. | | |
| 13-14 | Piping's systems and accessories (open and | | |

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| | closed system), (two, three, four pipe system) comparative study and design and applications. | | |
| 15 | Evaporative cooling systems, application and design of (air cooler, cooling tower, and air washers), psychometric chart. | | |
| Half-year Break | | | |
| 16 | Air conditioning systems (types and selection) and its relation with occupant's activities. | Design projects for different types of air conditioning systems | |
| 17-18 | All air systems, designs, features, advantages, disadvantages, comparative study with other systems, and psychometric chart. | | |
| 19 | Single zone system (variable volume constant temperature and variable temperature constant volume), comparative study (cost and performance) , psychometric chart. | | |
| 20 | Dual conduit system, multi zone system comparative study, psychometric chart. | | |
| 21 | Air –water systems (types, design, features, advantages, disadvantages, comparative study with other systems, psychometric chart. | | |
| 22 | Induction unit systems (study, design, types, and controls). | | |
| 23 | All –water systems, control, performance, design and applications. | | |
| 24 | Fan –coil unit systems ,and primary air and fan –coil system (comparative study ,design and control) | | |
| 25 | Dx –systems, package system, control and applications. | | |
| 26 | Energy conservation in air conditioning systems. | | |
| 27 | Heat recovery systems. | | |
| 28 | Heat pump system for air conditioning system. | | |
| 29-30 | evaluations and commercial analysis for air conditioning systems. | | |

Practical part: Design projects for different types of air conditioning systems