

HVAC system - Advance course - Course Outline

S.No	Topic	Brief Outline	Remarks
1	Thermodynamics and Heat Transfer	Quick Review of Thermodynamics and Heat Transfer—Basics for Refrigeration and HVAC	
2	Refrigeration System components & its details	History and Few applications of Refrigeration, Major components of Refrigeration system and its details, Mollier Chart & COP, Superheat and Sub-cooling, Refrigeration System's Operating Pressures, COP ,EER and SEER, A.C, Factors Influencing Comfort, COMFORT AIR-CONDITIONING and Process A.C, Types of Air-conditioners, Central A.C system and its Major Components.	
3	Sustainable HVAC System design	Sustainability – Elements of “Sustainable Development, Sustainable building – Necessity, Sustainable building – design principles, Design Considerations, ASHRAE Green Guide, CFC & OD, CFCs & HCFCs Alternatives- Reality, Cooling Load Calculations- Quick review Facts about Indoor Air Quality, Basics of Water Systems, BMS Specifications, Technology alternatives for sustainable system, Environmental sustainability assessment of buildings in hot climates, Few facts of AC system design, HVAC design process, Humidity control, VFD vs VSD, Tender specifications- Technical, Passive Design and Active Design ,Design Standards, Conflicts between cost and safety, Good Practice Check List	
4	HVAC system design for hospitals	Scope, Purpose, Classifications, Room Types, Specific Ventilation Requirement pertaining to ASHRAE 170, Filtration requirement, Documentation requirement, Typical project example.	
5	Ventilation System as per ASHRAE 62.1, Working on IAQ sheet as per 62.1	Scope of Standard, General Requirements, Ventilation Requirements, Zone outdoor airflow requirement, Construction Requirements, Operating Requirements	

6	Things to consider while designing a building for LEED, Green Globe, WELL & BREEAM certification.	Introduction, Overview, Classification of certificates, Purpose, Highlights, Points to remember	
7	VAV system Design	Scope, Purpose, Classifications, Types of VAV Systems Specific Requirement ,Selection Criteria, Typical project example.	
8	Smoke Evacuation System & Smoke Evacuation System	Scope, Purpose, Classifications, Types of Smoke Extraction Systems, Specific Requirement ,Selection Criteria, Typical project example, Types of staircase pressurization Systems, Specific Requirement ,Selection Criteria, Typical project example	
9	ECBC & ASHRAE 90.1 for Energy Efficiency	Energy Unit Intensity(EUI) ,Energy Performance and Integrated Design, ECBC building classifications, ASHRAE 90.1, HDD and CDD (Cooling Degree Days), Energy Saving in Buildings, Key Design Activities for Energy Efficiency, Energy conservation measures (ECMs) -Interdisciplinary discussions, Building Energy Quotient, Energy-Saving Strategies for Air-Handling System, Ventilation Quality	
10	Designing a Data Centre	Scope, Purpose, Classifications, Types of data centers Specific Ventilation Requirement Equipment Selection, Documentation Requirement, Typical project example,	