



Module 1

**Chapter 1 : Review of Thermodynamics
and Heat Transfer**

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**Chapter 2 : Basic Concepts of Refrigeration
and Refrigerants**

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Syllabus : Basic Knowledge : Carnot refrigerator, Carnot heat pump, Coefficient of performance, Reversed Carnot cycle and its limitation. Effect of temperature and pressure on COP of the cycle.

Refrigerants : Classification, Designation, Selection of refrigerant, Physical and chemical properties of refrigerants, Secondary refrigerants.

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Syllabus : Thermal Comfort Conditions : Selection of inside design conditions, thermal comfort, heat balance equation for a human being, factors affecting thermal comfort, Effective temperature, comfort chart and factors governing effective temperature, selection of outside design conditions.			Syllabus : Duct : Classification of ducts, duct material, pressure in ducts, flow through duct, pressure losses in duct Air flow through simple duct system, Equivalent diameter, Methods of duct system design		
Cooling Load Estimation : RSHF, ERSHF and GSHF Introduction, Components of cooling load Different heat sources Various load Estimation. Design of air conditioning system. Building survey and economic aspect used in design.			Air Handling Unit : Introduction to Fan coil unit, Types of fans used air conditioning applications, Fan laws, Filters supply and return grills, Sensors.		
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Module 6

**Chapter 11 : Applications of HVAC
and R Systems**
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