Heating Ventilation and

Air Conditioning Laboratory

Lab.Incharge: Mr. Adnan Qamar (Lecturer)

Coordinating Staff: Khawar Siddique (Lab Assistant)

Muhammad Usman Saleem (Lab Assistant)
Description of Lab. Layout

1. Door inn
2. Door out
3. White board
4. Notice board
5. Sitting chairs
6. Absorption refrigeration unit
7. Refrigeration basic unit
8. Thermo electric heat pump
9. Heating ventilation simulator
10. Black board
11. Teacher’s table
12. Reverse cycle refrigeration unit
13. Hydraulic bench
14. Mechanical heat pump
15. Bench top cooling tower
OBJECTIVES

1. Observation of the process within forced draught cooling tower.

2. Determination of all end state properties of air and water from tables or charts and the application of the steady flow equation to selected systems to draw up energy and mass balances.

3. Investigation of the effect of cooling on “approach to wet bulb” and Investigation of relation between air velocity and i) Wet bulb approach ii) Pressure drop through the packing

4. Investigation of the effect of packing density on the performance of the cooling tower and Relationship between Cooling Load and Cooling Range.

5. Investigation of Locally Designed Manufactured Packing.
OBJECTIVE

1. To determine the Coefficient of Performance of heat Pump and production of Heat Pump performance curves over a range of source and delivery temperatures.

2. Comparison of practical and Ideal Cycles on a P-H Diagram and determination of energy balance for Condenser and Compressor.

3. Production of Heat Pump performance curves based on the R134a properties at a variety of Evaporating and Condensing temper

4. Estimation of the effect of Compressor Pressure Ratio on Volumetric Efficiency.
Reverse Cycle Refrigeration and Air Conditioning Unit:

OBJECTIVE

OBJECTIVE

1. Demonstration of water circuit and ammonia circuit in the cycle using Electric Operation (Generator)

2. Demonstration of water circuit and ammonia circuit in the cycle using Gas Operation (Gas Burner).
Refrigeration Basic Unit:

**OBJECTIVE**


2. Lay out of the steam compression cycle in a diagram P-H and compression with the ideal cycle. Water as heat source. Heat pump water-water.

3. Preparation of the performance curves of the heat pump based on the properties of the refrigerant and at different condensation and evaporation temperatures. Water as heat source. Heat pump water-water.
OBJECTIVE

1. Investigation of effect upon the surface temperature of either face of module with increasing power (Peltire effect) and Investigation of the effect upon heat transfer direction of reversing the polarity of the power supply to module (Thomson or Lenz effect).

2. Investigation of the variation in open circuit voltage across the module due to the variation in surface temperature difference (Seeback effect)

3. Investigation of the power generation performance of the module with a steady load and increasing temperature difference and Estimation of the coefficient of performance of the module when acting as a refrigerator.
**OBJECTIVE**

Description of MIMIC diagram and component of simulator. And Observation of boiler, chiller, main AHU, VT circuit, DHW and controlling them through potentiometer and illuminated switches.

**Heating Ventilation and Air Conditioning Control and Fault Simulator:**