

Department of Agricultural Process Engineering

APE 368

Refrigeration and Air Conditioning 1 + 1 = 2

Theory- Principles of refrigeration. Second law of thermodynamics applied to refrigeration. Carnot cycle. Reversed Carnot cycle. Coefficient of performance, Unit of refrigeration. Refrigeration in food industry, Types of refrigeration systems, Mechanical vapour compression, Vapour absorption system. Components of mechanical refrigeration system, refrigerant, Desirable properties of ideal refrigerant. Cold storages. Insulation material, design of cold storages, defrosting. Thermodynamic properties of moist air. adiabatic saturation process, wet bulb temperature and its measurement, psychometric chart and its use, elementary psychometric processes. Air conditioning, principles, type and functions of air conditioning, physiological principles in air conditioning. Humidifiers and dehumidifiers, cooling load and calculations, types of air conditioners, applications.

Practical

Study of vapour compression and vapour absorption systems; Solving problems of refrigeration on vapour compression and absorption system; Experiment on the coefficient of performance of a domestic refrigerator; Experiments with the refrigeration tutor to study various components of refrigeration; Determination of the coefficient of performance of the refrigeration tutor; Visit to a cold storage plant and air conditioning unit; Experiments with air conditioning tutor to study various components; Determination of the coefficient of performance of air conditioning tutor; Experiment on humidifier for the determination of humidifying efficiency; Estimation of refrigeration load; Estimation of cooling load, Estimation of humidification and dehumidification load; Design of complete cold storage system. Estimation of refrigeration requirements in dairy & food plant. Visit to Cold storages and large A.C. Units.