

B.Tech Mechanical Engineering (AKU Syllabus) SEMESTER- VII

REFRIGERATION & AIR CONDITIONING Credit : 5

- 1. Air refrigeration system :** Refrigeration machine, heat pump, coefficient of performance, ideal refrigeration cycle, Bell – Coleman, refrigeration cycle, open and closed systems, application of air-refrigeration in air-crafts. **Lecture : 6**
- 2. Various compression systems :** Simple vapour compression refrigeration cycle, merits and Refrigerants demerits of this system over air refrigeration system, factors affecting the performance of a vapour compression refrigeration system, sub cooling and superheating of vapour, wet and dry compression, multistage vapour compression system, intercooler, flash chamber, accumulator and heat exchanger. **Lecture 8**
- 3. Vapour absorption system :** Simple and modified vapour absorption refrigeration system, Electrolux refrigerator, COP of heat operated refrigeration system. **Lecture : 5**
- 4. Special refrigeration system,** absorption, cascade, vortex, thermoelectric and steam jet refrigeration system. **Lecture : 4**
- 5. Refrigerants :** classification and nomenclature of refrigerants, primary and secondary refrigerants, properties of some common refrigerants, physical, chemical and thermodynamics properties, selection of refrigerants, leakage of refrigerants and methods of detection. **Lecture : 3**
- 6. Equipment :** Elementary discussion of refrigerating equipment, ice plant and cold storage. **Lecture : 1**
- 7. Psychometry :** Properties of air vapour mixture, wet bulb, dew point & dry bulb temperatures, humidity, specific humidity, humidity ratio, degree of saturation, relative humidity, total heat psychrometric relation, psychrometric charts and its uses, psychrometric processes evaporative cooling. **Lecture : 5**
- 8. Air conditioning :** General principle and requirement for comfort and air conditioning, thermodynamics of human body, estimation of heating and cooling loads, capacity of cooling coils, humidification and dehumidification unit and conditioner, central air conditioner, year around air condition, humidity and temperature control, industrial application of air conditioning system **Lecture : 10**

INTERNAL COMBUSTION ENGINE AND GAS TURBINE

- 1. Introduction :** classification : Two strokes, four stroke (SI and CI) engines, engines parts, engines working principle and valve timing diagram. **Lecture : 3**
- 2. Engine performance-test :** purpose and types, measurement of power, Engine system & performance parameters evaluation. **Lecture : 3**
- 3. Theory of combustion,** principle of combustion, S.I. & C. I. Engine combustion process & parameters their dependence on engine variables and operating parameters. **Lec : 3**
- 4. Adiabatic flame temperature,** combustion processes & combustion chamber for SI and CI engines pollutant formation and control, effect of engine variables on combustion processes, knowing in SI & CI engines. **Lecture : 5**
- 5. Petroleum based fuel,** gasoline & diesel fuel and their properties. Chemically correct air-fuel ratio and load variation. **Lecture : 3**
- 6. Carburetors & modern air fuel systems,** compensating devices, venture and jet dimension calculation, injection system. **Lecture : 6**
- 7. Super charging,** engine lubrication and cooling. **Lecture : 2**
- 8. Gas turbine :** Principle. Simple, open gas turbine cycle, effect of operating variables on thermal efficiency. **Lecture : 5**
- 9. Regenerative reheat cycles,** gas turbine applications, closed cycle gas turbine. **Lecture : 5**
- 10. Jet propulsion :** working principle, thrust power, propulsive force and efficiency. **Lecture : 4**
- 11. Rocket engine :** theory of operation and its applications, propellant. **Lecture : 3**

COMPUTER AIDED DESIGN Credit : 3

Engineering design principles, interactive design using workstations, and software tools. Computer graphics.

Introduction to GKS. Starnase onraroos. Computer aided design and drafting, data base management system, simulation and optimization. Applications in Civil Engineering, structural design

**Elective-I &
Elective-II**