UNIT – I Mechanics, Kinetics and Dynamics:


UNIT – II Strength of Materials and Design:


UNIT - III Fluid Mechanics and Turbo Machinery:

Fluid properties, fluid statics, manometry, buoyancy, control volume analysis of mass, momentum and energy, fluid acceleration, differential equations of continuity and momentum, Bernoulli’s equation, viscous flow of incompressible fluids, boundary layer, elementary turbulent flow, flow through pipes, head losses in pipes, bends etc. Turbomachinery: Pelton wheel, Francis and Kaplan turbines - impulse and reaction principles – velocity diagrams.

UNIT – IV Thermodynamics:

Basic concepts, Zeroth, First and Second laws of thermodynamics, thermodynamic system and processes, Carnot cycle. Irreversibility and availability, behaviour of ideal and real gases, thermodynamic relations, properties of pure substances, calculation of work and heat in ideal processes, analysis of thermodynamic cycles related to energy conversion, Fuel and combustion.
UNIT – V Heat and Mass Transfer:

Modes of heat transfer one dimensional heat conduction, resistance concept, electrical analogy, unsteady heat conduction, fins dimensionless parameters in free and forced convective heat transfer, various correlations for heat transfer in flow over flat plates and through pipes thermal boundary layer effect of turbulence radiative heat transfer, black and grey surfaces, shape factors, network analysis; heat exchanger performance, LMTD and NTU methods.


UNIT – VI Materials Science and Metallurgy:

Constitution of alloys and phase diagrams, steels, cast iron, TTT diagram, heat treatment of ferrous and non-ferrous metal, surface modification techniques, non-metallic materials, mechanical properties and testing, crystal defects and strengthening mechanisms, conducting and semi conducting materials, magnetic and dielectric materials, Engineering ceramics, Engineering and commodity polymers, composites.

UNIT – VII Production Technology:

Foundry Technology- types of pattern, moulding and casting methods, design of castings, defects, Hot and Cold working, metal forming processes- types and defects, metal joining processes, types and design of weldment, welding metallurgy, welding defects, Metal cutting, machine tools - center lathe, drilling, milling, grinding, gear cutting and broaching, unconventional machining processes, CNC machine tools, Part programming.

UNIT – VIII Metrology and Quality control:

Linear and angular measurements, Interferometry, laser interferometers, Types, Computer Aided Inspection, Basic concept of CMM- Types of CMM, Machine vision, Form measurement-Straightness- Flatness, Roundness, Surface finish measurement, contact and non contact method, Measurement of power, flow and temperature. Statistical quality control, control charts, acceptance sampling, reliability, TQM, 5S, ISO standards.
UNIT - IX CAD / CAM / CIM / FEA:


UNIT – X Industrial Engineering and Management:

Work study - techniques, Method study - objectives - basic procedure, work measurement - objectives - basic procedure, machine loading and scheduling, product sequencing, inventory control - E O Q - quantity discounts, ABC Analysis material handling systems, operations research, simplex method, Transportation model, Assignment model CPM and PERT.
Management theory and practice, planning - nature and purpose of Planning, Decision making, Organising, staffing, Motivation, Leadership, controlling, control techniques.