

Centre of Mechanical Engineering (Graduate)

(1) Fluid Mechanics:

Properties and classification of fluids, Manometry, forces on immersed surfaces, Center of pressure, Buoyancy. Elements of stability of floating bodies. Kinematics and Dynamics.

Irrrotational and incompressible. Inviscid flow, Velocity potential, Pressure field and forces on immersed bodies. Bernoulli's equation. Fully developed flow through pipes. Pressure drops calculations. Measurements of flow rate and Pressure drop. Elements of boundary layer theory, Integral approach, Laminar and turbulent flows, Separations. Flow over weirs and notches. Open channel flows, Hydraulic jump. Dimensionless numbers, Dimensional analysis, Similitude and modeling. One-dimensional isentropic flow, Normal shock wave, Flow through convergent-divergent ducts. Oblique shock-wave, Rayleigh and Fanno lines.

(2) Fluid Machinery

Performance, Operation and control of hydraulic Pump and impulse and reaction turbines, Specific speed, Classification. Energy transfer, Coupling, Power transmission, Velocity diagrams. Partial admission. Reciprocating, Centrifugal and axial flow Pumps and Compressors.

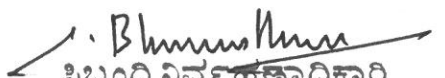
(3) Theory of Machines:

Kinematic and dynamic analysis of planer mechanisms. Cams. Gears and gear trains. Flywheels. Governors. Balancing of rigid rotors and field balancing. Balancing of single and multi-cylinder engines. Linear vibration analysis of mechanical systems. Critical speeds and whirling of shafts Automatic controls.

(4) Strength of Materials:

Stress and strain in two dimensions Principal stresses and strains, Mohr's construction, linear elastic materials, isotropy and anisotropy, stress-strain relations, uniaxial loading; thermal stresses. Beams: Bending moment and shear force diagram, bending stresses and deflection of beams. Shear stress distribution. Torsion of shafts, helical springs. Combined stresses, thick- and thin-walled pressure vessels. Struts and columns. Strain energy concepts and theories of failure.

(5) Engineering Materials:


 ಸಿಬ್ಬಂದಿ ನಿರ್ವಹಣಾಧಿಕಾರಿ
 ಬೆಂಗಳೂರು ನೀರು ಸರಬರಾಜು ಮತ್ತು
 ಒಳಚರಂಡಿ ಮಂಡಳಿ
 ಕಾವೇರಿ ಭವನ, ಬೆಂಗಳೂರು-560 009.

Basic concepts on structure of solids. Crystalline materials. Defects in crystalline materials. Alloys and binary phase diagrams. Structure and properties of common engineering materials. Heat treatment of steels. Plastics. Ceramics and composite materials. Common applications of various materials.

(6) Production Engineering:

Metal Forming: Basic Principles of forging, drawing and extrusion; High energy rate forming; Powder metallurgy.


Metal Casting: Die casting, investment casting, Shell Molding, Centrifugal Casting, Gating and Rising design; melting furnaces.
Fabrication Processes: Principles of Gas, Arc, Shielded-arc Welding; Advanced Welding Processes, Weldability; Metallurgy of Welding.

Metal Cutting: Turning, Methods of Screw Production, Drilling, Boring, Milling, Gear Manufacturing, Production of flat surfaces, Grinding and Finishing Processes. Computer Controlled Manufacturing Systems-CNC, DNC, FMS, Automation and Robotics.

Cutting Tools Materials, Tool Geometry, Mechanism of Tool Wear. Tool Life and Machinability; Measurement of cutting forces. Economics of Machining. Unconventional Machining Processes. Jigs and Fixtures. Fits and tolerances. Measurement of surface texture, Comparators Alignment tests and reconditioning of Machine Tools.

Pumping System:

Pumping Stations, general arrangement of an Pumping Stations and its operation, Pumping mains, water hammer and surge tanks, turbines, gates, prime movers, model testing, peak load plants, Pumps.

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