

Syllabus of Civil Engineering (Graduate)

(1) Building Materials

Timber: Different types and species of structural timber, density-moisture relationship, strength in different directions, defects, influence of defects on permissible stress, preservation, dry and wet rots, codal provisions for design, Plywood.

Bricks: Types, Indian Standard classification, absorption, saturation factor, strength in masonry, influence of mortar strength on masonry strength.

Cement: Composition, different types, setting times, strength, tests on cements (Lab & Field)

Cement Mortar: Ingredients, proportions, water demand, mortars for plastering and masonry.

Concrete: Importance of W/C Ratio, strength, ingredients including admixtures, workability, testing for strength, elasticity, non-destructive testing, mix design methods.

(2) Design of Concrete and Masonry Structures

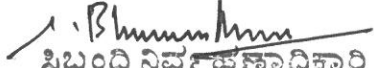
Limit state design for bending, shear, axial compression and combined forces. Codal provisions for slabs, beams, walls and footings. Working stress method of design of R.C. members.

(3) Construction Practice, Planning and Management Concreting Equipment:

Weight Batcher, Mixer, vibrator, batching plant, and concrete pump. Cranes, hoists, lifting equipment. Earthwork equipment: Power shovel, hoe, dozer, dumper, trailers and tractor, rollers, sheep foot rollers, pumps. Construction, Planning and Management: Bar chart, linked bar chart, work-break down structures, Activity-on-arrow diagrams. Critical path, probabilistic activity durations; Event based networks. PERT network; Time-cost study, crashing; Resource allocation.

(4) Fluid Mechanics, Open Channel Flow, Pipe Flow:

Fluid Properties, Pressure, Thrust, Buoyancy, Flow Kinematics; energy equations and its applications; Flow measurement; Relative motion; Moment of momentum; Viscosity, Boundary layer and Control, Drag, Lift; Dimensional Analysis, Modeling, Cavitation, Flow oscillations; Momentum and Energy principles in Open Channel flow and in closed pipe flows, Flow controls, Hydraulic jump, Flow sections and properties; Normal flow, Gradually varied flow; Surges; Flow development and losses in pipe flows; Measurements; Siphons; Surges and Water hammer; Pipe networks.


ಸಿಬ್ಬಂದಿ ನಿರ್ವಹಣಾಧಿಕಾರಿ
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5) Hydraulic Machines and Pumps, types:

Centrifugal pumps, types, performance parameters, scaling, pumps in parallel; Reciprocating pumps, air vessels, performance parameters; Hydraulic ram.

(6) Water Supply Engineering:

Sources of supply, yields, design of intakes and conduits; Water demands; Water quality standards; Control of water-borne diseases; Primary and secondary treatment, detailing and maintenance of treatment units; Conveyance and distribution systems of treated water; leakages, detection and control. Water Pollution Control - Sources of Water Pollution, types and its effects, Prevention and Control measures of water pollution, Legislation with regards to water pollution control.

(7) Wastewater Engineering:

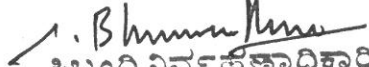
Domestic and industrial sewage, volume of domestic sewage, variability of flow, limiting velocities of sewer. Characteristics and Analysis of Sewage, Sewage System- Types of Sewers, Sewerage Appurtenances, Systems of sewage collection and disposal; Design of sewers and sewerage systems; pumping; Characteristics of sewage and its treatment, Disposal of products of sewage treatment, stream flow rejuvenation; Institutional and industrial sewage management; Plumbing Systems.

(8) Foundation Engineering:

Types of foundations, Selection criteria, bearing capacity, settlement, laboratory and field tests; Types of piles and their design and layout. Foundations on expansive soils, swelling and its prevention, foundation on swelling soils.

(9) Strength of Material (SOM)

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.


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