

Civil Engineering

DEGREE STANDARD

UNIT I

CONSTRUCTION MATERIALS

Engineering Properties uses and tests for stones and bricks lime - sources, types and properties - cement - composition, tests, specifications, properties - types of cements and admixtures. Miscellaneous materials - Glass, Rubber Plastics and materials for acoustics and insulation.

UNIT II

CONSTRUCTION PRACTICE

Stone Masonry - Classification, construction details and supervision - Brick Masonry - bonds - Damp proof courses - construction details of walls and arches. Shoring, scaffolding, underpinning. Floor finishes and roof coverings. Stairs and stair cases - Layout - types - suitability, Doors, Windows and ventilators Types - Selection, Fire resistant structure.

UNIT III

ENGINEERING SURVEY

Levelling - Types - LS and CS contouring calculation of areas and volume Theodolite survey - Traversing - Heights and Distances Trigonometry - Modern surveying instruments. Setting out of curves Permanent adjustments of levels and theodolites.

UNIT IV

ESTIMATING AND COSTING

Types of estimates - Writing technical specifications and tender documents. Types of contracts - terms and conditions conflicts and arbitration - Rate Analysis - schedule of rates Valuation and Rent fixation.

UNIT V

STRENGTH OF MATERIALS

Stresses and strains - Elastic constants, - shear and tension compound stresses principal stresses and planes Theories of failure. Theory of simple bending - shear stress - distribution in beams Deflection of beams Strain energy in elastic deformation, impact fatigue and creep.

UNIT VI

THEORY OF STRUCTURES

Proposed cantilever and fixed beams Continuous beams - Theorem of three moments - portal frames - moment distribution method - Columns - short & long columns, unsymmetrical sections. Euler's theory - critical loads for different end conditions Analysis of arches - Eddy's theorem - suspension bridges /moving loads - influence lines. Domes and Retaining walls - stability conditions - checking.

UNIT VII

SOIL MECHANICS

Site Investigation and Soil sampling - classification of soil Engineering properties of soil - SPT and its interpretation soil - Water interaction - permeability, seepage shear strength of soils - Determination of C and ϕ Stress distribution in soils - Boussinesq's and Westergaard's. Theory of consolidation - consolidation test. compaction of soils - Moisture density relationship - stability of slopes analysis.

UNIT VIII

FOUNDATION ENGINEERING

Shallow Foundations Bearing capacity Theory - Settlement analysis Methods of improving - bearing capacity and minimising settlement - Types of footings - Design principles mat foundations. Deep foundations - Piles - Static and Dynamic formulae - Pile cap - group of piles - pile load test. Retaining walls - Earth pressure theories.

UNIT IX

WATER SUPPLY & TREATMENT

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Estimation of water resources - Ground water hydraulics for forecasting demand hydraulics. Forecasting demand - Impurities of water - physical, chemical and bacteriological analysis - water borne diseases - pumping and gravity schemes - Water treatment plants chlorination.

UNIT X

SEWAGE TREATMENT & POLLUTION CONTROL

Disposal of sanitary sewage - sewer systems - design flow for separate, storm and combined systems - sewer design sewer Appurtenances - Sewage pumping - Types of pumps. Sewage Treatment primary, secondary and tertiary levels plants - Sludge treatment and disposal Industrial wastes Rural sanitation - Air pollution - Solid waste management.

PAPER -II

UNIT I

CONCRETE TECHNOLOGY RC

Tests on cement and aggregates - High grade cements High strength concrete Testing of fresh and hardened concrete - Non destructive testing - Concrete mix design - IS method quality control - centering and shuttering sheet piles - slips and moving forms. Concrete hollow block masonry Construction joints.

UNIT II

DESIGN OF R.C. ELEMENTS

Methods of design of concrete members. Limit state and working stress design Design of flexural members. Design of singly and doubly reinforced rectangular and flanged Design of slabs and columns R.C. footings

UNIT III

MISCELLANEOUS STRUCTURES

Steel structures - welded connections - Design of tension and compression members - trusses Design of purlins - Design of steel columns & beams. Design and construction of prestressed concrete beams - Design of masonry Chimneys and stacks.

UNIT IV

WATER RESOURCES ENGINEERING

Water Resources in Tamil Nadu Water Resource Planning . Master Plan for water. Water budget & Development Plan. Reservoir planning & Management. Flood control. Channel improvement Land Management.

UNIT V

IRRIGATION ENGINEERING

Soil Plant Water Relationship - Water requirement of crops - Irrigation methods. Irrigation efficiencies. Water logging & consequences - Salinity & alkalinity. Reclamation. Head works and distribution works. Cross drainage works.

UNIT VI

TRAFFIC ENGINEERING

Traffic Engineering and Traffic surveys - Intersections, road signals and markings - grade separations - parking & traffic control - Traffic regulation & safety. Accident investigation - measures for accident reduction. Traffic Management

UNIT VII

HIGHWAY ENGINEERING

Highway planning in India - Road classification - Geometric design of highways. Construction of Earth WBM, bituminous and concrete roads - Design of flexible and rigid pavements. Design of joints in cement concrete roads - Drainage of roads - Maintenance of Roads.

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UNIT VIII

RAILWAYS AIRPORTS AND HARBOURS

Details of components of permanent way - geometric design - points & crossings - signalling

Interlocking and level crossings.

Airport planning Components of Airport - Site selection - Airport zoning - planning of terminal buildings. Harbours & Ports - types - components & their functions - Layout of a harbour - Docks - Wet and dry - Break waters.

UNIT IX

PROJECT MANAGEMENT

Construction Management - Importance and scope. Construction planning scheduling and monitoring - Cost control Quality control and inspection Network analysis by CPM and PERT - Determination of Critical path & floats - Project Management using CPM/PERT

UNIT X

COMPUTER APPLICATIONS

Types of computers - components of modern computer systems - Office Automation - Word processing, spread sheets and database management - Developing Flow charts for solving Engineering problems - Computer Aided Design and drafting - Advantages of Computer Aided drafting over traditional drafting - Developing 2D, 3D drawings and solid modelling.