

TAMIL NADU PUBLIC SERVICE COMMISSION

SYLLABUS
CIVIL ENGINEERING
DIPLOMA STANDARD

MODULE 1: ENGINEERING MECHANICS:-

Direct stresses and strains (Tensile & compressive) due to Axial forces - shear stress distribution in rectangular and circular sections due to transverse shear - shear stress distribution in circular shafts due to torque - Bending stresses in rectangular sections due to bending moment - shear force and Bending moment diagrams for statically determinate beams - Geometrical properties of sections - pin jointed perfect frames with vertical loads on nodal points.

- Types of flow (Laminar, turbulent, steady, unsteady, uniform, non-uniform) - Flow through pipes - Losses - Hydraulic gradient and total energy lines. Bernoulli's theorem - use of Orifice, Mouthpiece, Orifice meter and venturimeters - Flow through chels - Bazin's and Manning's formula - Economical sections for open channels - Types of Irrigation - Rainfall - Runoff - Ground water - Types of well - Test for yield of wells - River weirs and Anaicut - Tank sluices - surplus weirs and flush escape.

MODULE 2: MECHANICS OF STRUCTURE:-

Deflection of cantilever and simply supported beams - shear force and Bending moment diagrams for statically indeterminate structures (Propped cantilever, Fixed Beams, continuous beams, Non-sway Portal frames) using Mohr's theorems and moment distribution method.

Euler's and Rankin's formula for columns - Stresses due to eccentric loads - combined stresses due to direct loads and bending moments in rectangular sections.

MODULE 6: SURVEYING:-

Types of Surveys - Chain surveying - Compass surveying, plane table surveying - Levelling - contouring - Theodolite traversing - Trigonometrical levelling - Tacheometry - Field work - simple problems.

MODULE 3: CONSTRUCTION MATERIALS & CONSTRUCTION PRACTICE:-

Bricks, Tiles, Cement, Timber, Steel, Plastics, P.V.C. Paints, Mortars, concretes - Different types, qualities, requirements, standard specifications.

Different types of Foundations, Masonry, Floors, Roofs, Doors and Windows. Weathering Course, Damp proof course, plastering painting, colour washing - specifications for different works.

MODULE 7: WATER SUPPLY AND SANITARY ENGINEERING:-

Sources of water - Conveyance of water - Treatment of water - Quality of water - Tests on water - Distribution systems - plumbing system in buildings. Sewers - collection and disposal of sewage - Treatment of sewage - Sanitary lines and fittings in buildings.

MODULE 4: TRANSPORTATION ENGINEERING:-

Roads - Different types - methods of formation of water bound macadam, bituminous and concrete roads - Hill roads - Requirements - camber, gradient, super elevation, carriage way, pavements, drainage system, sight distance etc., - Traffic Engineering BRIDGES - Classification of bridges - site selection and alignment - Foundation, substructure and super-structure.

SOIL MECHANICS - Classification of soils - Properties of different soils - Bearing capacity, liquid limit, plastic limit, shrinkage limit, void ratio, porosity - particle size distribution - Grading of Soils.

MODULE 8: ESTIMATING AND COSTING:-

Systems of taking out quantities - material requirement for different items of works - Preparation of data for works - Report writing - valuation of buildings and properties - Fixation of rents - Approximate estimates - Detailed estimate and Abstract estimate for buildings, well, sump, septic tanks, compound wall etc.

MODULE 9: STRUCTURAL ENGINEERING:-

Reinforced cement concrete structure - Analysis and design of singly and Doubly reinforced rectangular and T-beam sections - cantilever, simply supported, continuous beams - oneway and two way slabs - lintels and sunshades - staircases - Rectangular and circular short columns - Isolated column footings. (All designs by Limit state method only) Steel structures - simple beams - plated beams - Tension and compression members - simple columns - Roof truss members and their connections.

MODULE 5: FLUID MECHANICS AND IRRIGATION:-

Measurement of pressure in liquids - pressure distribution and total pressure on immersed surfaces

MODULE 10: CONSTRUCTION MANAGEMENT:-

Planning of a project - Factors to be considered - project reports - Organisation structure in construction departments - construction planning - CPM and PERT networks - contracts - Tenders and Tender documents - Bill - Supervision and Quality control - Safety measures in construction sites - Banking practice - cash flow diagrams.

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SYLLABUS

CODE NO.158

**ARCHITECTURAL ASSISTANTSHIP
(DIPLOMA STANDARD)**

UNIT – I ENGINEERING MECHANICS

Simple Stresses and Strain – Stress and Strain – Moduli of Elasticity / Elastic constants – Application of stress and strain in engineering field – Behaviour of ductile and brittle material – Loads – Shear Force and Bending Moment – Geometrical properties of sections – Centroid – Moment of Inertia – Stress in Beams and Shafts – Stresses in Beams due to bending – Stress in shafts due to torsion – Pin Jointed Frames - Analytical Method – Graphical Method

UNIT – II BUILDING MATERIALS

Soil – Stone – Clay Products – Lime – Cement – Timber – Concrete – Ferrous and Non-Ferrous Metals – Glass – Plastics – Gypsum – Insulation Materials – Asphalt, Sealants & Adhesives – Protective and Decorative Coatings – Water Proofing and Damps Proofing Materials – Rural Building Materials.

UNIT – III HISTORY OF ARCHITECTURE

Egyptian Architecture – Greek Architecture – Roman Architecture – Beginning of Indian Architecture – Early Christian Architecture – Byzantine Architecture – Gothic Architecture – France – Renaissance Architecture – Italy – Hindu Architecture – Indo-Islamic Architecture – Contemporary World Architecture.

UNIT – IV STRUCTURAL ENGINEERING

Slope and Deflection of Beams – Propped Cantilevers – Fixed Beams – Arches – Continuous Beams – Theorem of Three Moments – Continuous Beams – Moment Distribution Method – Columns and Struts – Combined Bending and Direct Stresses – Masonry Dams – Earth Pressure and Retaining Walls – Working Stress Method Design of Beams for Flexure by L.S.M – Design of T-Beams and Continuous Beams by L.S.M – Design of Beams for Shear by L.S.M – Design of Oneway Slabs by L.S.M - Design of Twoway Slabs by L.S.M - Design of Staircases by L.S.M - Design of Columns by L.S.M - Design of Column Footings – Design of Simple Beams – Design of Tension Members – Design of Compression Members – Design of Welded Connections.

UNIT – V ENVIRONMENTAL ENGINEERING AND POLLUTION CONTROL

Quantity of Water – Collections and Conveyance of Water – Quality of Water – Treatment of Water – Distribution System – Appurtenances and Maintenance of Water Lines – Collections and Conveyance of Sewage – Treatments and Disposal – Environmental Pollution and Control – Industrial Waste Water Treatment and Solid Waste Disposal.

UNIT – VI SURVEY THEORY

Chain Surveying – Compass Surveying – Plane Table Surveying – Levelling – Theodolite – Contouring – Minor Instruments.

UNIT – VII BUILDING SERVICES

Electrical Services – Wiring System – Lighting – Renewable Energy Sources – Mechanical Services – Fire Hazards, Safety & Design Regulations – Air Conditioning – Ventilation – Acoustics – Intelligent Architecture.

UNIT – VIII QUANTITY SURVEYING AND COSTING

Stages of Detailed Estimate – Measurements & Material Requirement – Specification & Report Writing – Approximate Estimates – Areas and Volumes – Data – Valuation – Detailed Estimate.

UNIT – IX TOWN PLANNING

Town Planning Principles – Road and Street Planning – Housing – Economy, Society, Environment and Transport Policy and Planning – Town Planning Rules, Building Bye-Laws & Development Control Rules.

UNIT – X COMPUTER APPLICATION IN ARCHITECTURAL

Study of operating System – Using Windows – Using AutoCAD / 3DMAX / Civil Architect / 3D HOME / Architectural Design Desktop Software Packages – Setting limits and creating entities like LINE, ARC, CIRCLE etc – Editing the drawing with edit commands like TRIM, FILLET, COPY, MOVE etc.

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**TOWN AND COUNTRY PLANNING
(POST DIPLOMA STANDARD)**

UNIT – I HISTORY OF HUMAN SETTLEMENTS

Early human settlements, Town building during River valleys civilization – Town building practices during ancient Greek and Roman period – Town building practices during Medieval and Renaissance periods – Effect of Industrial Revolution on planning of cities – Modern planning concepts.

UNIT – II PLANNING PRINCIPLES

Introductory Aspects of Town and Country Planning and Basic Term – Residential area Planning – Nonresidential Landuse area planning – Geographical study of regional Landuses and distribution of settlements – Element of Regional planning and Rural Development.

UNIT – III STATISTICS & COMPUTER ORIENTATION

Central Tendency computation – Sampling and Diagram – Computer Aided Drawing – Computer Application in Data Analysis – Population forecasting.

UNIT – IV PLANNING ECONOMICS

Economic Operation – Project Appraisal – Urbanization & Housing policies – Economics of Urban Growth.

UNIT – V PLANNING SOCIOLOGY

Basic concept & Scope of Study – Urbanization & Ecological theories – Social Issues in urban area – Housing Redevelopment – Citizen participation.

UNIT – VI PLANNING PRACTICE

Regional Plan concepts and studies – Masterplan concept and surveys – Masterplan needs and plan formulation – Soning and Urban Renewal – Detailed area Development Plan.

UNIT – VII PLANNING LEGISLATION AND ADMINISTRATION

Town & Country Planning Acts in Britain - Evolution of Planning Legislation – Town and Country Planning Code in Tamil Nadu – Building Regulations and Development Control – Planning related acts.

UNIT – VIII ARCHITECTURE AND LANDSCAPE ARCHITECTURE

Architecture an Introduction – Essentials in Architectural buildings – Principle of presentation – Study of Architectural spaces – Townscape Elements – Fundamentals of Landscape Architecture – Role of Landscape Architect and the importance of Environmental Protection – Components of Landscape plant materials – Components of landscape water and other man-made items – Design Principles.

UNIT – IX TRAFFIC AND TRANSPORTATION

Transportation systems – Urban Roads Classification – Traffic Engineering – Traffic Regulations Traffic Signs and Traffic Markings – Traffic Intersections at Grade-Traffic Intersections Grade Separated Parking & Street Light Facilities – Railways Airways and Waterways Terminal Facilities Location Aspects – Railways, Airways and waterways Terminal Facilities-Layouts – Urban Transportation Planning Process-surveys and Studies – Urban Transportation Planning Process – Forecasting and Plan Formulation.

UNIT – X REMOTE SENSING

Geometry of Aerial Photographs – Image characteristics and their significance – Mapping by Manual and Mechanical Methods – Application to Physical Planning.

All Technical Examination (S.S.L.C. / H.S.C / Diploma Standard)

Main Examination

General Studies (Topics for Objective type)

Unit-I General science :

Physics Nature of Universe-General Scientific laws-Inventions and discoveries-National scientific laboratories-Mechanics and properties of matter-Physical quantities, standards and units-Force, motion and energy-Magnetism, electricity and electronics-Heat, light and sound

Chemistry-Elements and Compounds-Acids, bases and salts-Fertilizers, pesticides, insecticides

Botany-Main Concepts of life science-Classification of living organism-Nutrition and dietetics-Respiration

Zoology-Blood and blood circulation-Reproductive system-Environment, ecology, health and hygiene-Human diseases, prevention and remedies-Animals, plants and human life

Unit- II. Current Events

History Latest diary of events-national -National symbols-Profile of States-Eminent persons & places in news-Sports & games-Books & authors -Awards & honors'-India and its neighbors

Political Science-Problems in conduct of public elections-Political parties and political system in India-Public awareness & General administration-Welfare oriented govt. schemes, their utility-

Geography-Geographical landmarks- Economics

:Current socio-economic problems Science: Latest

inventions on science & technology

Unit- III. Geography

Earth and Universe-Solar system-Monsoon, rainfall, weather & climate-Water resources --- rivers in India-Soil, minerals & natural resources-Forest & wildlife-Agricultural pattern-Transport & communication-Social geography - population-density and distribution-Natural calamities - Disaster Management.

Unit_ IV. History and culture of India and Tamil Nadu

Indus valley civilization-Guptas, Delhi Sultans, Mughals and Marathas-Age of Vijayanagaram and the bahmanis-South Indian history-Culture and Heritage of Tamil people-India since independence-Characteristics of Indian culture-Unity in diversity - race, colour, language, custom-India-as secular state-Growth of rationalist, Dravidian movement in TN-Political parties and populist schemes

Unit-V. INDIAN POLITY

Constitution of India--Preamble to the constitution- Salient features of constitution- Union, state and territory- Citizenship-rights amend duties- Fundamental rights- Fundamental duties- Human rights charter- Union legislature – Parliament- State executive-. State Legislature – assembly- Local government – panchayat raj – Tamil Nadu- Judiciary in India – Rule of law/Due process of law-. Elections-. Official language and Schedule-VIII-. Corruption in public life-. Anti-corruption measures –CVC, lok-adalats, Ombudsman, CAG- Right to information- Empowerment of women- Consumer protection forms-

Unit-VI. INDIAN ECONOMY

Nature of Indian economy- Five-year plan models-an assessment-Land reforms & agriculture-Application of science in agriculture-Industrial growth-Rural welfare oriented programmers-Social sector problems – population, education, health, employment, poverty-Economic trends in Tamil Nadu

Unit-VI. INDIAN NATIONAL MOVEMENT

National renaissance--Emergence of national leaders-Gandhi, Nehru, Tagore-Different modes of agitations-Role of Tamil Nadu in freedom struggle Rajaji, VOC, periyar , Bharathiar & others

Unit- VII. APTITUDE & MENTAL ABILITY TESTS

Conversion of information to data-Collection, compilation and presentation of data - Tables, graphs, diagrams-Parametric representation of data-Analytical interpretation of data -Simplification-Percentage-Highest Common Factor (HCF)-Lowest Common Multiple (LCM)-Ratio and Proportion-Simple interest-Compound interest-Area-Volume-Time and Work - Logical Reasoning-Puzzles-Dice-Visual Reasoning-Alpha numeric Reasoning-Number Series.