### IV Year
DISTANCE EDUCATION PROGRAMME IN ENGINEERING ( Civil )

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject</th>
<th>Type of Course</th>
<th>Internal Marks</th>
<th>External Marks</th>
<th>Total Marks</th>
<th>Duration of Univ. Exam.</th>
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<tbody>
<tr>
<td>DMCIV401</td>
<td>Concrete Technology</td>
<td>Theory</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td>3 hrs</td>
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<tr>
<td>DMCIV402</td>
<td>Water Resources Engineering-II</td>
<td>Theory</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td>3 hrs</td>
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<tr>
<td>DMCIV403</td>
<td>Transportation Engineering</td>
<td>Theory</td>
<td>25</td>
<td>75</td>
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<td>3 hrs</td>
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<tr>
<td>DMCIV404</td>
<td>Project Planning and Management</td>
<td>Theory</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td>3 hrs</td>
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<tr>
<td>DMCIV405</td>
<td>Elective –I Multistoreyed Structures</td>
<td>Theory</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td>3 hrs</td>
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<tr>
<td>DMCIV406</td>
<td>Elective -I Elementary Environment Sanitation</td>
<td>Theory</td>
<td>25</td>
<td>75</td>
<td>100</td>
<td>3 hrs</td>
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<tr>
<td>DMCIV407</td>
<td>Transportation Engineering Lab</td>
<td>Practical</td>
<td>50</td>
<td>50</td>
<td>100</td>
<td>3 hrs</td>
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<tr>
<td>DMCIV408</td>
<td>Computer Applications Lab</td>
<td>Practical</td>
<td>50</td>
<td>50</td>
<td>100</td>
<td>3 hrs</td>
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<tr>
<td>DMCIV409</td>
<td>Project Work</td>
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<td>100</td>
<td>100</td>
<td>200</td>
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<td><strong>Total Marks</strong></td>
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IV year
Civil Engineering
DMCIV-401: Concrete Technology

Unit I
Types of Cements and testing of cement, IS code provisions, significance of blended cements, selection of right cement for different purposes.

Unit-II
Aggregates and testing of aggregates, relevance and significance of various tests, IS code provisions, tests on Water for suitability in concrete.

Unit-III
Admixtures and Construction materials, role of chemicals on the properties of green concrete and hardened concrete etc., curing compounds, Viscosity modifying agents etc. Suitability of chemicals for use in concrete.

Unit-IV
Tests on fresh concrete, strength of concrete, elasticity, creep and shrinkage, testing of hardened concrete, concrete mix design, special concrete and concreting methods, Factors affecting workability, Non destructive testing methods and their importance in quality assurance and durability assessment, sampling for tests.

Unit-V
Durability aspects of concrete, identification of failure reasons, repairs and rehabilitation schemes for various types of failures/damages of structures, Grouting, guniting and other techniques. Protective coatings. Treatments to reinforcements.

Text Books:
1) Concrete Technology by M.S.Shetty
DMCIV-402: Water Resources Engineering

Unit-I


Unit-II


Unit-III


Unit-IV

Water power engineering a) Development of Hydro-electric power in India – Comparison of Thermal and Hydropower costs – assessment of available power – Definitions of different terms in water power-Load curve-Load factor, capacity factor, Utilisation factor, Diversity factor-Storage and Pondage-Stream flow data and its analysis-Flow duration curves Firm and by Principal components of Hydel Scheme – Fore bay, intake structure, Trash racks, design of penstocks-water hammer analysis-Surge tanks-Their functioning and types-Selection of type of turbines –No. of units – Specific speed power house- Substructure and super structure-Layout of units.
Unit-V


DMCIV-403: Transportation Engineering

UNIT-I

UNIT II

UNIT III
Railway Engineering: Permanent way cross section - Components and their functions, Geometric Design, points and crossings, Track design, Track drainage, layout of Railway station and Railway yard.

UNIT IV
Dock and Harbour Engineering: Layout of a Port components and functions, classification, site selection, Navigational Aids.

UNIT-V

DMCIV- 404:Project Planning and Management

UNIT I: Pert and CPM : Introduction : Origin of PERT and CPM, planning, Scheduling and controlling Bar charts, Milestone charts, weaknesses in Barcharts, PERT and CPM networks Comparison, Event, Activity, Rules for drawing networks, Numbering the events (Fulkerson's law : Lummy activities, Time estimates - Expected time, Earliest allowable occurrence time, Latest allowable occurrence time, slack, project duration, probability of completion, Start and Finish time estimates, Floats, Project scheduling, Critical and subcritical path.


UNIT III : Contracts : Contracts - Elements of contract, offer acceptance and consideration, valid and void contract, Departmental execution of works. Master Roll Form 21. Piece work Agreement, piece work agreement form, work order; Contract system with tenders - Definitions - Contract Contractor, Quotation, Earnest money, Security money, Tender, Tender notice, Tender form, Bidding procedure, Irregularities in Bidding, award, Types of contracts - Lumpsum contract; lumpsum and schedule contract, Item rate contract, sub-contracts, joint ventures, Arbitration Disputes and claim settlement.

UNIT IV: Works-Management:Execution of works-Estimates, supplementary estimates, revised estimates, petty works, repair works. Stores - Stores organisation, procedures for procuring controlled materials, stores accounting and control, suspense head, stock taking and shortage. Tools and Plant and Accounting Register, Accounting Verification, Cash account, Debit and Credit cash account, Running bill, first and final bill, Head receipt, Refund of security money.


DMCIV-405: (Multistoreyed Structures) Elective

Introduction: Types of structural systems, practical adoptability.
UNIT I: Analysis of frames with and without sway by moment distribution method and Kani’s method.
UNIT II: Analysis of frames for horizontal loads by portel, cantilever, and factor methods.
UNIT III: Introduction to matrix methods: Analysis of continuous beams and single bay single storey portal frames by stiffness method.
UNIT IV: Analysis of single bay single storey portal frames and continuous beams by Flexibility matrix methods.
UNIT V: Shear walls: Introduction, behavior of cantilever walls with rectangular cross section, flange cantilever shear walls, moment-axial load interaction for shear wall sections.

Textbooks: 1. Reinforced concrete structures - Park and Paulay, John Wiley & sons,
DMCIV-406: (Elementary Environment Sanitation) Elective

UNIT I
Origin and spread of Communicable diseases like Cholera, Small pox, Tuberculosis, Malaria, Filaria, and Plague-common methods. Role of Public Health Engineering in the preventive aspects of the above diseases-Roll of vectors in transmitting diseases and Rodent control methods.

UNIT II
Rural water supply and sanitation-Sanitary protection of wetis-springs, Economic methods of treatmen-Excrete disposal systems -types of sanitary privies.

UNIT III
Refuse sanitation-Quality and quantity of garbage night Soil -methods of conveyance and sanitary disposal methods latest technologies adopted to disposes of the solid wastes.

UNIT IV
Food Sanitation - milk and milk products sanitary maintenance of catering-establishments measures.

UNIT V
Sanitary requirements and maintenance of the Public Utility Services like schools, hospitals and offices and in other public buildings.

Textbooks:1 Municipal&Rural Sanitation by Ehlers Steel2.Environmental Sanitation of Salvito.
DMCIV-407: Transportation Engineering Laboratory


DMCIV -408 : Computer Applications Laboratory

Development of programmes in C / FORTRAN for the following applications:

**Group-A:**
1) Determination of Bending Moment Diagram and Deflections for different loading conditions for a simply supported Beam and Cantiliver Beam.
2) Determination of fixed end moments for different loading conditions of a fixed beam.
3) Calculation of influence line diagrams at any section of a Simply supported Beam.

**Group-B**
4) Estimation of Run off for a Catchment
5) Estimation of Friction factor for laminar and Turbelent flow
6) Minor losses in pipe flow
7) Determination of normal depth and critical depth for rectangular & Trapezoidal channels

**Group-C:**
8) Classification of Soils.
9) Determination of coefficient of permeability, Degree of Consolidation and Shear Strength
10) Settlement of foundations in Cohesive Soil
11) Estimation Earth Pressures in Cohesive and Cohesion less soils

**Group-D:**
12) Analysis of pipe network through Hardy cross method
13) Applications of problems in Environmental Engg.,

**Group-E:**
14) Quantity estimation of Civil Engineering Structures and Construction Management.
15) Application of problems in Transportation Engg.,
16) Conversion of Angles from WEB to RB
17) Calculation of Stopping sight distance and overtaking sight distance on plain terrains as well as slopes.
18) Calculation of extra-widening for pavements.
19) Determination of length of transition curve.
Group-F:
20) Computation of water surface profiles in open channel flows. (Demonstration only)
21) Design of Slabs using IS code method. (Demonstration Only)
22) Analysis and Design of Beams by using Limit state method. (Demonstration only)
23) Design of columns subjected to axial load and Uni axial Moment. (Demonstration only)
24) Design of Isolated Footing. (Demonstration only)
25) Design of rolled steel columns, Beams and built up Beams. (Demonstration only)
26) Stability Analysis of Slopes. (Demonstration only)
28) Preparation of Contour Maps and Alignment fixing of Roads by using AUTO CIVIL. (Demonstration only)
29) Design of valley curves and summit curves for stopping sight distance and save overtaking sight distance. (Demonstration only)
30) Designing the rate of superrelevatin for curves on highways. (Demonstration only)

At least two programmes from each of the above groups A to E have to be developed and executed by the students. The University practical examination should cover the programmes listed in the above groups. The programmes listed under Group-F are excluded for practical examination.