### COURSE STRUCTURE : III B.Tech., I Semester

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<th>Periods/Week</th>
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*Audit Course

### COURSE STRUCTURE : III B.Tech., II Semester

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*Audit Course*
III B.Tech. I Semester

10BT4HS01: MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY

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UNIT – I
INTRODUCTION TO MANAGERIAL ECONOMICS AND DEMAND ANALYSIS: Definition, Nature and scope of managerial economics.

UNIT – II
THEORY OF PRODUCTION AND COST ANALYSIS:
Cost Concepts: Opportunity vs. out lay costs, Fixed vs. variable costs - Explicit vs. implicit costs - Out of pocket vs. inputted costs – Break even analysis (BEA) - Determination of break even point (Simple problems).

UNIT – III
INTRODUCTION TO MARKETS AND PRICING:
Market Structure: Types of Markets - Features of perfect competition - Monopoly and monopolistic competition - Price and output determination in perfect competition and monopoly.

UNIT – IV

UNIT – V
INTRODUCTION AND PRINCIPLES OF ACCOUNTING:
UNIT – VI
FINAL ACCOUNTS: Introduction to final accounts - Trading account - Profit and loss account and balance sheet with simple adjustments (Simple problems).

UNIT – VII
CAPITAL AND CAPITAL BUDGETING:
Capital: Significance - Types of capital.

UNIT – VIII

TEXT BOOKS

REFERENCES
III B.Tech. I Semester  
10BT50101 : STRUCTURAL ANALYSIS – II  

UNIT-I  
MOVING LOADS : Maximum SF and BM at a given section and absolute maximum SF and BM due to single concentrated load, UDL longer than the span, UDL shorter than the span, two point loads and several point loads – Equivalent uniformly distributed load – Focal length.

UNIT-II  
INFLUENCE LINES : Influence line for support reaction, shear force and bending moment – Load position for maximum SF and for maximum BM at a section – Point loads, UDL longer than the span, UDL shorter than the span – Influence lines for forces in members of Pratt and Warren trusses.

UNIT-III  
MOMENT DISTRIBUTION METHOD : Basic concepts - Stiffness factor – Carry over factor - Application to continuous beams with and without settlement of supports.

UNIT IV  
SLOPE–DEFLECTION METHOD : Basic concepts - Slope deflection equation - Application to continuous beams with and without settlement of supports.

UNIT–V  
KANI’S METHOD : Analysis of continuous beams including settlement of supports - Single bay, single storey portal frames without side sway.

UNIT–VI  
ENERGY METHOD : Strain in linear elastic system - Expression of strain energy due to axial load, bending moment and shear forces – Castigliano’s first theorem – Deflections of simple beams and pin jointed plane trusses.

UNIT–VII  
REDUNDANT PIN-JOINTED FRAMES : Introduction to indeterminate frames – Static and kinematic indeterminacies – Castigliano’s theorem – Analysis of pin-jointed frames with upto two degrees of internal and external indeterminacies.
UNIT – VIII
MULTI STOREY FRAMES (Approximate Methods) : Substitute frame method (Two cycle method) for gravity loads – Portal method and cantilever method for lateral loads.

TEXT BOOKS

REFERENCES
III B.Tech. I Semester
10BT50102 : REINFORCED CEMENT CONCRETE STRUCTURES - II

UNIT-I
STAIRCASES : Types of staircases - Stairs spanning longitudinally and transversally.

UNIT-II
FOUNDATIONS : Combined footings - Strap footing - Raft foundations.

UNIT-III
PILE FOUNDATIONS : Design of piles and pile caps – Underreamed piles – Grade beams

UNIT-IV
RETAINING WALLS : Lateral earth pressure - Design of cantilever and counter fort retaining walls.

UNIT-V
DOMES : Circular domes – Stresses - Membrane theory - Design.

UNIT-VI
WATER TANKS-I : Design of members in tension - Minimum steel areas and covers - Design of circular water tanks resting on ground.

UNIT VII
WATER TANKS-II : Design of underground water tanks – Overhead water tanks – Circular beams.

UNIT-VIII

TEXT BOOKS
REFERENCES

Codes: IS 456-2000 and IS 1343-1980 code books are to be permitted into the examination hall.
UNIT – I
INTRODUCTION TO HYDROLOGY: Definition and scope of hydrology – Hydrologic cycle – Practical applications and historical development – Precipitation – Types and forms of precipitation – Weather and seasons in India.

UNIT – II

UNIT – III
Infiltration: Definition – Factors affecting infiltration – Infiltration equation and indices – Measurement.

UNIT – IV

UNIT – V
HYDROGRAPHIC ANALYSIS: Components of Hydrograph – Unit Hydrograph – Derivation – Use and limitation of unit hydrograph.

UNIT – VI

UNIT – VII
GROUNDWATER HYDROLOGY: Introduction – Forms of subsurface water – Classification of formations – Aquifer characteristics – Porosity – Specific yield.
UNIT – VIII


TEXT BOOKS

REFERENCES
III B.Tech. I Semester
10BT50104 : SOIL MECHANICS

UNIT – I

UNIT – II

UNIT –III

UNIT –IV
SEEPAGE THROUGH SOILS : Effective stress principle - Effective stress under different loading conditions - Seepage pressure - Quicksand condition – Seepage through soils – Flownets: Characteristics and Uses - Seepage through earth dams with horizontal filter - Critical hydraulic gradient.

UNIT – V
STRESS DISTRIBUTION IN SOILS : Boussinesq’s and Westergaard’s theories for point loads and areas of different shapes – Newmark’s influence chart – Approximate methods – Contact pressure distribution.

UNIT – VI
COMPACTION : Mechanism of compaction - Optimum moisture content and maximum dry density - Factors affecting compaction - Effects of compaction on soil properties - Laboratory determination of OMC and MDD - Field compaction methods - Compaction control.
UNIT – VII

UNIT – VIII
SHEAR STRENGTH OF SOILS : Mohr-Coulomb failure theories – Types of laboratory shear strength tests – Strength tests based on drainage conditions and their field applicability – Shear strength of cohesionless soils – Critical void ratio – Liquefaction - Shear strength of cohesive soils.

TEXT BOOKS

REFERENCES
UNIT – I
INTRODUCTION: Importance of geology from civil engineering point of view – Brief study of case histories of failure of some civil engineering constructions due to geological drawbacks – Importance of physical geology, petrology and structural geology; Weathering: Effects of weathering of rocks – Importance of weathering with reference to dams, reservoirs and tunnels.

UNIT – II
MINERALOGY: Definition of mineral – Importance of study of minerals – Different methods of study of minerals – Advantages of study of minerals by physical properties – Identification of minerals – Physical properties of common rock forming minerals: Feldspar, Quartz, Flint, Jasper, Olivine, Augite, Hornblende, Muscovite, Biotite, Asbestos, Chlorite, Kyanite, Garnet, Talc, Calcite – Study of other common economic minerals such as Pyrite, Hematite, Magnetite, Galena, Pyrolusite, Graphite, Magnesite and Bauxite.

UNIT – III

UNIT – IV
STRUCTURAL GEOLOGY: Outcrop - Strike and dip – Classification and recognition of folds, faults, unconformities, and joints – Their importance in-situ – Foliation and lineation – Concept of stress and strain, analysis of stress and response of rock to stress – Analysis of deformation and strain ellipsoid – Common types of soils, their origin and occurrence in India.

UNIT – V
Earthquakes, their causes and effects – shield areas and seismic zones – Seismic waves - Richter scale - Precautions to be taken for building construction in seismic areas – Landslides, their causes and effect - Measures to be taken to prevent their occurrence.

UNIT – VI

UNIT – VII
GEOLOGY OF DAMS AND RESERVOIRS: Types of dams – Geological considerations in the selection of a dam site – Analysis of dam failures of the past – Factors contributing to the success of a reservoir.

UNIT – VIII
TUNNELS: Purposes of tunneling – Effects of tunneling on the ground – Geological considerations (i.e., Tithological, structural and groundwater) in tunneling, over break and lining in tunnels.

TEXT BOOKS

REFERENCES
III B.Tech. I Semester

10BT50111 : COMPUTER AIDED BUILDING DRAWING

L T P C
- - 3 2

SOFTWARE: AUTOCAD

LIST OF EXERCISES

1. Buildings with load bearing walls (Flat and pitched roof) – Including details of doors and windows
2. RCC framed structures
3. Industrial buildings – North light roof trusses
4. Perspective view of one and two storey buildings

TEXT BOOKS


REFERENCES

LIST OF EXERCISES

1. Study of physical properties and identification of rock forming minerals.
2. Study of physical properties and identification of ore forming minerals.
5. Megascopic identification of common metamorphic rocks.
6. Interpretation and drawing of sections for geological maps showing tilted beds, faults, unconformities etc.
7. Simple structural geology problems.
III B.Tech. I Semester

10BT4HS02 : ADVANCED ENGLISH COMMUNICATION SKILLS (Audit Course)

L   T    P   C
-   3    -   -

UNIT - I
VOCABULARY BUILDING : Synonyms and antonyms - Word roots - One-word substitutes - Prefixes and suffixes - Study of word origin - Analogy, idioms and phrases.

FUNCTIONAL ENGLISH : Starting conversation - Responding appropriately and relevantly - Using the right body language - Role play in different situations.

UNIT - II
READING COMPREHENSION : Reading for facts - Guessing meanings from context - Scanning, skimming, inferring meaning and critical reading.

UNIT - III
ACADEMIC ESSAY WRITING : Accuracy, brevity, clarity, brainstorm - List your ideas - Sub-headings - Revising content and organisation.

UNIT - IV
TECHNICAL REPORT WRITING : Types of formats and styles - Subject-matter - Subject-organization - Clarity, coherence and style - Planning - Data-collection - Tools - Analysis.

UNIT - V
CAREER SKILLS : Career direction - Exploring your talents - Personality inventories - Write a "Who I Am" statement - Thinking further - Perform career research - How do I get hired - Creating job satisfaction - Identify your satisfaction triggers - Positive attitude - Maintain a balanced lifestyle - Analyze your job in terms of your interests - Set goals to bring your interests and responsibilities in line - Personal SWOT analysis - Making the most of your talents and opportunities - Shaping your job to fit you better - Future proof your career - Managing your emotions

UNIT - VI
RESUME WRITING: Structure and presentation - Planning - Defining the career objective - Projecting ones strengths and skill-sets - Summary - Formats and styles - Cover letter.at work - Get the recognition you deserve.
UNIT - VII

GROUP DISCUSSION: Dynamics of group discussion - Intervention - Summarizing - Modulation of voice - Fluency and coherence - Participation, relevance, assertiveness, eye contact and body language.

UNIT - VIII

INTERVIEW SKILLS: Concept and process - Pre-interview planning - Opening strategies - Answering strategies - Interview through tele and video-conferencing.

REFERENCES

SUGGESTED SOFTWARE
1. TOEFL, GRE and IELTS (Kaplan, Aarco and Barrons, Cliffs)
2. Softwares from 'train2success.com'
5. Study Skills Success, (Essay, Vocabulary strategies, IELTS), Young India Films.
6. Vocabulary Builder, Young India Films.
7. E-correspondence, Young India Films.
UNIT – I
GENERAL ITEMS OF WORK IN BUILDING: Standard Units Principles of working out quantities for detailed and abstract estimates – Calculation of quantities of brick work, RCC, PCC, Plastering, whitewashing, colourwashing and painting/varnishing for shops, rooms, residential building with flat and pitched roof – Approximate method of estimating.

UNIT – II

UNIT – III
ROADS AND CANALS:
Canals: Earthwork in canals – Different cases – Estimate of earthwork in irrigation channels.

UNIT – IV
RATE ANALYSIS: Working out data for various items of work overhead and contigent charges - Task or out – Turn work - Labour and materials required for different works - Rates of materials and labour - Schedule of Rates - Preparing analysis of rates for the following items of work: Concrete, RCC Works, Brick work in foundation and super structure, plastering, CC flooring, whitewashing.

UNIT – V
REINFORCEMENT BAR SCHEDULE: Reinforcement bar bending and bar requirement schedules.

UNIT – VI
CONTRACTS AND TENDERS: Contracts: Elements of contract- offer acceptance and consideration - Valid contract - Types of contracts – Lumpsum contract, schedule contract, item rate contract, sub-contracts, joint ventures - Departmental execution of works - Muster Roll Form 21 - Piece work agreement form - Work order.
**Tenders:** Contract contractor – Quotation - Earnest money - Security money – Tender - Tender notice, tender form - Bidding procedure, irregularities in bidding – Bidding award - Arbitration disputes and claim settlement.

**UNIT – VII**  
**VALUATION OF BUILDINGS:** Necessity - Different terms used in valuation and their meaning - Different methods of building valuation and rent fixation - Outgoings – Depreciation - Methods for estimating cost depreciation – Escalation.

**UNIT – VIII**  
**SPECIFICATIONS:** Purpose and method of writing specifications - General specifications - Detailed specifications for different items of building construction.

**TEXT BOOKS**  

**REFERENCES**  
UNIT-I

By Limit State Method: [ IS 800-2007]

UNIT–II

UNIT - III
WELDED CONNECTIONS : Strength of welds - Butt and fillet welds - Design of fillet welds subjected to axial load - Design of fillet welds subjected to moment acting in the plane and at right angles to the plane of the joints - Beam to beam and beam to column connections.

UNIT–IV
TENSION MEMBERS : Net effective sectional area for angle and tee sections - Design of tension members - Lug angles.

UNIT-V
BEAMS : Bending, shear and bearing strength – Design of simple beams - Design of plated beams - Design of connection of cover plates with the flanges of beams.

UNIT-VI
COMPRESSION MEMBERS : Effective length, radius of gyration and slenderness of compression members - Design strength - Design of axially loaded compression members.

UNIT –VII
BUILT-UP COMPRESSION MEMBERS : Design of built-up compression members - Design of lacings and battens - Design principles of eccentrically loaded columns - Splicing of columns.

UNIT – VIII
DESIGN OF COLUMN FOUNDATIONS : Design of slab base and gusseted bases - Column bases subjected moment.
TEXT BOOKS

REFERENCES

IS Codes: IS -800 – 2007, IS – 875 – Part III and Steel Tables are to be permitted into the examination hall.
III B.Tech. II Semester
10BT60103: WATER RESOURCES ENGINEERING

UNIT – I

UNIT – II

UNIT – III

UNIT – IV

UNIT – V

UNIT – VI
EARTH DAMS: Types – Causes of failure – Criteria for safe design – Seepage through earth dam – Measures of seepage control.

UNIT – VII
CANAL STRUCTURES: Types of falls – Canal regulation works – Canal outlets.
UNIT – VIII
CROSS DRAINAGE WORKS: Types – Selection of site aqueducts - Super passages – Level crossing.

TEXT BOOKS

REFERENCES
III B.Tech. II Semester

10BT60104: ENVIRONMENTAL ENGINEERING - I

UNIT – I
INTRODUCTION: Importance of water supply Engineering - Need for protected water supply – Objective of water supply systems – Flow diagram of water supply systems.

UNIT – II

UNIT – III

UNIT – IV
QUALITY REQUIREMENTS OF WATER: Sources of water pollution – Water borne diseases – Physical, chemical and biological impurities – Tests conducted for determining impurities – Water standards for different uses - Water quality standards WHO.

UNIT – V
WATER TREATMENT – I: Conventional water treatment processes units and their functions - Theory and design of aeration, coagulation, flocculation, and clarification - Determination of optimum dose of alum for coagulation of water.

UNIT – VI
UNIT – VII
ADVANCED TREATMENT METHODS: Removal of fluorides, arsenic, hardness, iron and manganese, salinity, colour, organic chemical and biological residues, Removal of Persistant Organic Pollutants – Adsorption with activated carbon, ion-exchange resins, membrane processes, chemical oxidation and softening.

UNIT – VIII
WATER SUPPLY ARRANGEMENTS IN BUILDINGS: Definition of technical terms used in water supply arrangements – Identification of different water supply of pipes – General layout of water supply in single storey and multi storeyed buildings - Principles and precautions in laying pipe lines in the premises of buildings - Connection from water main to building – Water supply fittings – Detection and prevention of leakage.

TEXT BOOKS

REFERENCES
UNIT I
HIGHWAY DEVELOPMENT AND PLANNING : Highway development in India – Necessity for highway planning - Different road development plans - Classification of roads - Road network patterns – Highway alignment - Factors affecting alignment - Engineering surveys – Drawings and reports.

UNIT – II

UNIT – III

UNIT – IV

UNIT – V
HIGHWAY DRAINAGE : Importance of highway drainage – Requirements – Surface drainage – Subsurface drainage – Drainage of slopes and erosion control – Road construction in water logged areas and black cotton soils.
UNIT – VI
RAILWAY ENGINEERING: Permanent way components – Cross section of permanent way – Functions of various components like rails, sleepers and ballast – Rail fastenings – Creep of rails – Theories related to creep – Adzing of sleepers – Sleeper density.

UNIT – VII
GEOMETRIC DESIGN OF RAILWAY TRACK: Gradients – Grade compensation – Cant and negative super elevation – Cant deficiency – Degree of curve – Crossings and turn out.

UNIT – VIII
AIRPORT ENGINEERING: Factors affecting selection of site for airport – Aircraft characteristics – Geometric design of runway – Computation of runway length – Correction for runway length – Orientation of runway – Wind rose diagram – Runway lighting system.

TEXT BOOKS

REFERENCES
III B.Tech. II Semester
10BT60106 : FOUNDATION ENGINEERING

**UNIT – I**

**UNIT – II**
**LATERAL EARTH PRESSURE :** Types of Earth Pressures – Plastic equilibrium in soils – Rankine’s theory – Earth pressures in cohesionless and cohesive soils - Coloumb’s wedge theory – Earth pressure on retaining walls of simple configurations - Graphical methods (Rebhann and Culmann) - Pressure on the wall due to single line load alone.

**UNIT – III**
**EARTH RETAINING STRUCTURES :** Types of retaining structures - Stability considerations of gravity and cantilever retaining walls - Proportioning of retaining walls - Cantilever sheet pile walls - Anchored bulk heads (free earth support method only).

**UNIT – IV**

**UNIT – V**
**BEARING CAPACITY OF SHALLOW FOUNDATIONS :** Types and choice of foundation - Depth of foundation - Types of shear failure – Safe bearing capacity – Terzaghi’s, Meyerhof’s, Skempton’s and IS methods - Effect of groundwater table on bearing capacity.

**UNIT – VI**
**ALLOWABLE BEARING PRESSURE :** Bearing capacity from penetration tests - Allowable bearing pressure - Safe bearing capacity and settlement from plate load test – Presumptive bearing capacity – Allowable settlements of structures – Settlement analysis.
UNIT – VII
PILE FOUNDATIONS: Types of piles – Factors influencing the selection of pile - Load carrying capacity of piles in granular and cohesive soils - Static and dynamic pile formulae – In-situ penetration tests - Pile load tests – Negative skin friction - Load carrying capacity of pile groups in sands and clays – Settlement of pile groups.

UNIT – VIII

TEXT BOOKS

REFERENCES
III B.Tech. II Semester

10BT60111 : GEOTECHNICAL ENGINEERING LAB

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LIST OF EXPERIMENTS

1. Tests for Atterberg’s limits
2. Determination of field density - core cutter and sand replacement method
3. Grain size analysis
4. Permeability of soil - constant head test and variable head test
5. Compaction test
6. Relative density test
7. CBR test
8. Consolidation test
9. Unconfined compression test
10. Tri-axial compression test
11. Direct shear test.
12. Vane shear test

III B.Tech. II Semester

10BT60112 : ENVIRONMENTAL ENGINEERING LAB

LIST OF EXPERIMENTS

1. Determination of pH and turbidity
2. Determination of conductivity and total dissolved solids.
### LIST OF EXPERIMENTS

1. Determination of pH and turbidity
2. Determination of conductivity and total dissolved solids.
3. Determination of alkalinity/acidity.
4. Determination of chlorides.
5. Determination and estimation of total solids, organic solids and inorganic solids.
6. Determination of iron.
7. Determination of dissolved oxygen.
9. Determination of total phosphorous.
10. Determination of B.O.D
11. Determination of C.O.D
III B.Tech. II Semester
10BT60114 : SPREADSHEET APPLICATIONS IN CIVIL ENGINEERING (AUDIT COURSE)

LIST OF EXERCISES

1. Introduction to MS Excel as a Spreadsheet tool, overview of toolbars, accessing, saving excel files, using help and resources. Creating a spreadsheet using the features: Gridlines, format cells, summation, auto fill, formatting text, formulae in excel charts.
2. Creating a spreadsheet using the features: Split cells, Sorting, Conditional formatting, freeze panes, pivot tables, data validation.
3. Design of singly reinforced beam
4. Design of doubly reinforced beam
5. Design of one-way slab
6. Design of two-way slab
7. Design of isolated footings
8. Analysis of frames
9. Design of surplus weir
10. Design of trapezoidal notch
11. Design of canal regulator
12. Design of sewer pipe

TEXT BOOKS

REFERENCES