

Rationale

This subject is an applied engineering subject. Diploma holders in Civil Engineering will be required to supervise steel construction and fabrication. He may also be required to design simple structural elements, make changes in design depending upon availability of materials. This subject thus deals with elementary design principles as per BIS code of practice IS: 800

UNIT I

Structural Steel and Sections: Properties of structural steel as per IS Code, Designation of structural steel sections as per IS handbook and Fabrication and Erection of Steel Structures like trusses, columns and girders, Masonry structures – Design of brick column and wall foundations IS:800-2007

UNIT II

Riveted Connections: Types of rivets, permissible stresses in rivets, types of riveted joints, specifications for riveted joints as per IS 800. Failure of a riveted joint. Assumptions in the theory of riveted joints. Strength and efficiency of a riveted joint. Design of riveted joints for axially loaded members (No Staggered riveting). Welded connections: Types of welds and welded joints, advantages and disadvantages of welded joints design of fillet and butt weld. Plug and slot welds (Descriptive No numerical on plug and slot welds)

UNIT III

Tension Members: Analysis and design of single and double angle section tension members and their rivetted and welded connections with gusset plate as per IS:800

Beams: Analysis and design of single section simply supported laterally restrained steel beams.

UNIT IV

Compression Members: Analysis and design of single and double angle sections compression members (struts) and their rivetted and welded connections with gusset plate as per BIS:800. Columns: Concept of buckling of columns, effective length and slenderness ratio, permissible stresses in compression as per IS:800 for different end conditions. Analysis and Design of axially loaded single section steel

column. Types of column bases (Descriptive only), Beam and column, frame and seated connections (descriptive only, no design)

UNIT V

Roof Trusses: Form of trusses, pitch of roof truss, spacing of trusses, spacing of purlins, connection between purlin and roof covering. Connection between purlin and principal rafter (no design, only concept), Introduction to plate girder and functions of various elements of a plate girder

Important Note:

Use of IS: 800 and Steel Tables are permitted in examination.

Instructional Strategy

Teachers are expected to give simple problems for designing various steel structural members. For creating comprehension of the subject, teachers may prepare tutorial sheets, which may be given to the students for solving. It would be advantageous if students are taken at construction site to show fabrication and erection of steel structures. IS:800 may be referred along with code for relevant clauses

Recommended Books

1. Duggal SK, "Design of Steel Structures" by Standard Publishers, Delhi
2. Birinder Singh, "Steel Structures Design and Drawing", Kaption Publishing House, Ludhiana
3. Ram Chandra, "Design of Steel Structures", Standard Publishers, Delhi
4. LS Negi, "Design of Steel Structure" Tata McGraw Hill, New Delhi
5. S Ramamurthan, "Design of Steel Structures",
6. Harbhajan Singh, "Design of Steel Structures", Abhishek Publishing, Chandigarh
7. IS Code : 800-2007

Rationale

Diploma holders in Civil Engineering are supposed to prepare material estimates for various Civil Engineering works namely; buildings, irrigation works, public health works and roads etc. In addition, they must have basic knowledge regarding analysis of rates, contracting, principles of valuation. Therefore, this subject has great importance for diploma holders in Civil Engineering.

Detailed Contents**UNIT I**

Introduction to quantity surveying and its importance. Duties of quantity surveyor. Types of estimates : Preliminary estimates, Plinth area estimate, Cubic rate estimate, Estimate per unit base, Detailed estimates, Definition, Stages of preparation – details of measurement and calculation of quantities and abstract. Measurement: Units of measurement for various items of work as per BIS:1200, Rules for measurements, Different methods of taking out quantities – centre line method and long wall and short wall method.

UNIT II

Preparation of Detailed and Abstract Estimates from Drawings for: A small residential building with a flat roof and pitched roof building comprising of , Two rooms with W.C., bath, kitchen and verandah, Earthwork for unlined channel, WBM road and pre-mix carpeting, Single span RCC slab culvert, Earthwork for plain and hill roads, RCC work in beams, slab, column and lintel, foundations, users septic tank - 10 users - 50 users.

UNIT III

Calculation of quantities of materials for : Cement mortars of different proportion, Cement concrete of different proportion, Brick/stone masonry in cement mortar, Plastering and pointing, White washing, painting, R.C.C. work in slab, beams. Analysis of Rates :Steps involved in the analysis of rates. Requirement of material, labour, sundries, contractor's profit and overheads. Analysis of rates for finished items when data regarding labour, rates of material and labour is given: Earthwork in excavation in hard/ordinary soil and filling with a concept of lead and lift, RCC in roof slab/beam/lintels/columns,

Brick masonry in cement mortar, Cement Plaster, White washing, painting, Stone masonry in cement mortar, Running and maintenance cost of construction equipment.

UNIT IV

Contractorship: Meaning of contract, Qualities of a good contractor and their qualifications , Essentials of a contract, Types of contracts, their advantages, disadvantages and suitability, system of payment, Single and two cover-bids; tender, tender forms and documents, tender, notice, submission of tender and deposit of earnest money, security deposit, retention money, maintenance period, Classification and types of contracting firms/construction companies. Preparation of Tender Document based on Common Schedule Rates (CSR): Introduction to CSR and calculation of cost based on premium on CSR, Exercises on writing detailed specifications of different types of building works from excavation to foundations, superstructure and finishing operation , Exercises on preparing tender documents for the following:(Earth work ,Construction of a small house as per given drawing, RCC works, Pointing, plastering and flooring, White-washing, distempering and painting, Wood work including polishing, Sanitary and water supply installations, False ceiling, aluminum (glazed) partitioning , Tile flooring including base course, Construction of W.B.M/Concrete road)

UNIT V

Exercises on preparation of comparative statements for item rate contract Valuation: Purpose of valuation, principles of valuation, Definition of various terms related to valuation like depreciation, sinking fund, salvage and scrap value, market value, fair rent, year's purchase etc. Methods of valuation (i) replacement cost method (ii) rental return method

Instructional Strategy

This is an applied engineering subject. Teachers are expected to provide working drawings for various Civil Engineering works and students be asked to calculate the quantities of materials required for execution of such works and use of relevant software for preparing estimates. Teachers should conceptualize making analysis of rates for different items of works. It will be advantageous if students are given valuation reports for reading.

Recommended Books

1. Pasrija, HD, Arora, CL and S. Inderjit Singh, "Estimating, Costing and Valuation (Civil)", New Asian Publishers, Delhi,
2. Rangwala, S.C, Estimating and Costing", Anand, Charotar Book Stall
3. Chakraborti, M, "Estimating, Costing and Specification in Civil Engineering", Calcutta

4. Dutta, BN, "Estimating and Costing
5. Mahajan Sanjay, "Estimating and Costing" Satya Parkashan, DelhI.

Rationale

Diploma holders in Civil Engineering are required to supervise the construction of RC and steel structures. Thus one should be able to read and interpret structural drawings of RC and steel structures. The competence to read and interpret structural drawings is best learnt by being able to draw these drawings. Hence there is a need to have a subject devoted to preparation of structural drawings.

Detailed Contents**Part A****Drawing Exercises****RC Structures:**

Reinforcement details from the given data for the following structural elements with bar bending schedules

UNIT I

Beams : Singly and doubly reinforced rectangular beams and Cantilever beam (All beams with vertical stirrups)

UNIT II

RC Slabs : One way slab, Two way slab and Cantilever Slab. Columns and Footings : Square, Rectangular and Circular Columns with lateral ties and their isolated sloped column footings.

UNIT III

Portal Frame: Three bay two storey RC portal frame with blow up of column beam junctions. Dog legged stairs for single storey building.

Part B

Steel Structures:

Structural drawing from given data for following steel structural elements.

UNIT IV

Roof Truss – Drawing of Fink Roof Truss with details of joints, fixing details of purlins and roof sheets.
Plate Girder Plan and Elevation of Plate Girder with details at supports and connection of stiffness, flange angles and cover plate with web highlighting curtailment of plates.

UNIT V

Column and Column Bases - Drawing of splicing of steel columns. Drawings of slab base, gusseted base and grillage base for single section steel columns.

Column Beam Connections: Sealed and Framed Beam to Beam Connections, Sealed and Framed beam o
Column Connections

Recommended Books

1. Loyal JS “Civil Engineering Drawing”, Satya Parkashan, New Delhi
2. Chandel RP “ Civil Engineering Drawings”
3. Kumar; NS “ Civil Engineering Drawing “ IPH, New Delhi
4. Malik RS and Meo GA, “Civil Engineering Drawing” Asian Publishing House, New Delhi
5. Singh, Birinder “RCC Design and Drawing” Kaption Publishing House, New
Delhi.
6. Singh, Birinder “Steel Structures Design and Drawing”, Kaption Publishing House, New Delhi
7. Singh, Harbhajan, “Structural Drawings”, Abhishek Publishers, Chandigarh
8. B.V. Sikka, Civil Engineering Drawing.

Rationale

This is an applied civil engineering subject. The subject aims at imparting basic knowledge about construction planning and management, site organisation, construction labour, control of work progress, inspection and quality control, accidents and safety and accounts.

Detailed Contents**UNIT I**

Introduction: Significance of construction management, Main objectives of construction management and overview of the subject, Functions of construction management, planning, organising, staffing, directing, controlling and coordinating, meaning of each of these with respect to construction job. Classification of construction into light, heavy and industrial construction. Stages in construction from conception to completion. The construction team: owner, engineer, architect and contractors, their functions and inter-relationship, Construction Planning: Importance of construction planning, Stages of construction planning, Pre-tender stage, Contract stage, Scheduling construction works by bar charts, Definition of activity, identification of activities, Preparation of bar charts for simple construction work, Preparation of schedules for labour, materials, machinery and finances for small works, Limitations of bar charts. Scheduling by network techniques: Introduction to network techniques; PERT and CPM, differences between PERT and CPM terminology.

UNIT II

Organization: Types of organizations: Line, line and staff, functional and their characteristics Site Organization: Principle of storing and stacking materials at site. Location of equipment, Preparation of actual job layout for a building, Organizing labour at site

UNIT III

Construction Labour: Conditions of construction workers in India, wages paid to workers Important provisions of the following Acts: Labour Welfare Fund Act 1936 (as amended), Payment of Wages Act 1936 (as amended), Minimum Wages Act 1948 (as amended). Accidents and Safety in Construction:

Accidents – causes and remedies, Safety measures for, Excavation work, Drilling and blasting, Hot bituminous works, Scaffolding, ladders, form work, Demolitions, Safety campaign and safety devices

UNIT IV

Control of Progress: Methods of recording progress, Analysis of progress, Taking corrective actions keeping head office informed, Cost time optimization for simple jobs - Direct and indirect cost, variation with time, cost optimization. Inspection and Quality Control: Need for inspection and quality control, Principles of inspection. Stages of inspection and quality control for, Earth work, Masonry, RCC, Sanitary and water supply services

UNIT V

Accounts: Public Work Accounts: Introduction, technical sanction, administrative approval, allotment of funds, re-appropriation of funds bill, contractor ledger, measurement book running and final account bills complete, preparation of bill of quantities (BOQ), completion certificate & report, hand receipt, acquittance roll. Muster Roll labour, casual labour roll-duties and responsibility of different cadres, budget-stores, returns, account of stock, misc. P.W. advances T & P – verification, survey report, road metal material charged direct to works, account - expenditure & revenue head, remittance and deposit head, definition of cash, precaution in custody of cash book, imprest account, temporary advance, treasury challan, preparation of final bills. Students must learn to prepare accounts register, stock register.

Instructional Strategy

This is highly practice-based course and efforts should be made to relate process of teaching with direct experiences at work sites. Participation of students should be encouraged in imparting knowledge about this subject. To achieve this objective the students should be taken to different work sites for clear conception of particular topics, such as site organization, inspection of works at various stages of construction and working of earth moving equipment

Recommended Books

1. Harpal Singh, "Construction Management and Accounts", Tata McGraw Hill Publishing Company., New Delhi
2. Peurifoy, RL, "Construction Planning, Equipment and Methods", McGraw Hill, Tokyo
3. Singh, Harbhajan "Construction Project Management" Abhishek Publishers, Chandigarh
4. Verma, Mahesh; "Construction Equipment and its Planning and Application.

5. Dharwadker, PP; "Management in Construction Industry", , Oxford and IBH Publishing Company, New Delhi.
6. Gahlot PS; Dhir, BM; "Construction Planning and Management", Wiley Eastern Limited, New Delhi
7. Softwares :
 - (a) MS Project – Microsoft USA (b) Primavera

The project assigned to the group of students at the 5th semester level will have to be completed at the 6th semester. It may require complete field survey, a design & calculations of various structures associated with the project, comparative economic studies, preparations of estimates, laboratory/experimental work etc. On completion of the project work, a detailed technical report is to be submitted by every student in accordance with the standards adopted for technical report. There will be a viva-voce examination after the submission of the technical report. The H.O.D. would constitute a project evaluation board which will assess the individual project work. The weightage will be as follows:

- (i) Supervisor or Internal guide (From the department) = 40 %. Supervisor or internal guide will assess 20% for work performed and 20% for Project report.
- (ii) Project Report = 20 % (To be assessed by the evaluation board). Evaluation board assessment will be done by internal expert/supervisor & the external expert in the ratio of 1:1.
- (iii) Presentation & viva-voce = 40 %.

The evaluation board will comprise of supervisor, internal expert & one subject expert preferably from outside the University.

ELECTIVE-III

UNIT I

General introduction: Development of water power, Estimation of Hydropower potential, Comparison of hydro, thermal & nuclear power. Classification of hydro-power plants.

UNIT II

Analysis of stream flow & demand: Flow duration curve, firm power, secondary power, load & Load duration curves, load factor etc.

UNIT III

Water conveyance system: Power canals, Alignment. Penstocks: Alignment, types of penstocks, Economic diameter of penstocks, Anchor blocks.

UNIT IV

Dams: Selection of site, preliminary investigations, Final investigations. Rigid Dams: Basic principles of design & details of construction. Embankment Dams: Earthen dams, rock-fill dams, design Considerations. Spillways: Types of spillways, Spillway gates.

UNIT V

Power house details: Forebay, intakes, General layout of power house & arrangement of hydropower units; Underground power stations.

Books recommended:

1. Dandekar, M.M. "Water Power Engineering".
2. Deshmukh, M.M. "Water Power engineering", DanpatRai& Sons, New Delhi.
3. Arora, K.R. "Irrigation, Water Power & Water Resources Engineering", Standard Publishers Distributors, Delhi.

Rationale

Civil Engineering diploma holders must have the knowledge of different types of environmental aspects related to development activities so that they may help in maintaining the ecological balance and control pollution. They should also be aware of the related environmental laws for effectively combating environmental pollution. The class room instructions should be supplemented by field visits to show the pollution caused by urbanization and the combatment measures being adopted at site. Extension lectures by experts may be encouraged.

Detailed Contents**UNIT I**

Study of Importance of Environmental Engineering .Importance of clean environment, control of environmental pollution with respect to air, land and water. Conservation of natural resources, environmental education and awareness, sustainable development.

Environments and Ecology. Definition and understanding of environment and ecology concept, ecosystem and types of ecosystems, energy flow in an ecosystem, food chain, ecological pyramids, consortium and ecological balance

UNIT II

Water Pollution, Causes of pollution in surface and underground water eutrophication of lakes and its preventing measure; BIS standards for water quality.

Air Pollution :Definition, principal air pollutants, atmospheric parameters influencing air pollution, types of air contaminants and their sources, effects of air pollution on human beings, plants, animals, automobile pollution, BIS ambient air quality standards and measures to combat air pollution. Noise

Pollution :Definition, unit of measurement of noise, sources and effects of noise pollution and control of noise pollution

UNIT III

Effects of mining, blasting and deforestation ,Ill effects of mining, blasting and deforestation on the environment human life and wild life. Land Use: Effect of land use on environmental quality, land use and natural disasters, (land slides etc) soil degradation problems - erosion, water logging, soil pollution etc

UNIT IV

Environmental Impact Assessment: Definition and requirements, environmental impact assessment. Flow chart of environmental impact assessment methodology. Describe the need and importance of EIA. Legislation to Control Environmental Pollution (idea), Indian legislative acts for water, land and air pollution control – provisions, scope and implementation

UNIT V

Global Issues of Environmental Engineering, Global warming, ozone depletion, acid rain, oil pollution; radiation hazards and their control, concept of clean technology and carbon credits. Renewable Source of Energy :Role of non-conventional sources of energy (biogas, solar, wind etc) in environmental protection. Conservation of energy resources like coal, oil etc., alternative fuels, bio-diesel etc.

Instructional Strategy

Students should be encouraged to undertake project work related to environmental problems. They should visit industrial effluent treatment plant, water treatment plant and environmental engineering laboratory and study the impact of utilization of reclaimed by products.

Recommended Books

1. DS and Deswal SS “Environmental Engineering” Dhanpat Rai and Company (P) Ltd., Delhi.
2. Odum EP, “Fundamentals of Ecology”, Amarind Publication Co., Delhi.
3. DhamijaSK “Environmental Engineering and Management ; SK Kataria and Sons, Delhi.
4. DeAK, “Engineers Chemistry”, New Age Publication, Delhi.
5. KendeighSC, “Ecology”, Prentice Hall of India, Delhi.
6. Khitoliya, RK, “Environmental Pollution’, S Chand & Co. Ltd., New Delhi.
7. Bhatia, HS, “A text book of Environmental Pollution and Control”, Galgotia. Publishers, Delhi

Rationale

One of the major concerns of a civil engineer is to take care of the building works, already constructed, in order to keep these buildings in utmost workable conditions. Usually it is being felt that the buildings deteriorate faster for want of care and proper maintenance. The buildings usually have a shabby appearance due to cracks, leakage from the roofs and sanitary/water supply fittings. Thus the need for teaching the subject in proper perspective has arisen making students aware of importance of maintenance of buildings.

Detailed Contents**UNIT I**

Need for Maintenance Importance and significance of repair and maintenance of buildings, Meaning of maintenance, Objectives of maintenance, Factors influencing the repair and maintenance. Agencies Causing Deterioration (Sources, Causes, Effects) Definition of deterioration/decay. Factors causing deterioration, their classification, Human factors causing deterioration, Chemical factors causing deterioration, Environmental conditions causing deterioration, Miscellaneous factors. Effects of various agencies of deterioration on various building materials i.e. bricks, timber, concrete, paints, metals, plastics, stones

UNIT II

Investigation and Diagnosis of Defects, Systematic approach/procedure of investigation. Sequence of detailed steps for diagnosis of building defects/problems. List non-destructive and others tests on structural elements and materials to evaluate the condition of the building and study of three most commonly used tests.

UNIT III

Defects and their root causes. Define defects in buildings. Classification of defects. Main causes of building defects in various building elements. Foundations, basements and DPC, Walls, Column and Beams, Roof and Terraces, Joinery, Decorative and protective finishes, Services, Defects caused by dampness.

UNIT IV

Materials for Repair, maintenance and protection. Compatibility aspects of repair materials. State application of following materials in repairs: Anti corrosion coatings, Adhesives/bonding aids, Repair mortars, Curing compounds, Joints sealants, Waterproofing systems for roofs, Protective coatings

UNIT V

Remedial Measures for Building Defects. Preventive maintenance considerations. Surface preparation techniques for repair ,Crack repair methods, Epoxy injection, Grooving and sealing, Stitching, Adding reinforcement and grouting, Flexible sealing by sealant. Repair of surface defects of concrete: Bug holes, Form tie holes, Honey comb and larger voids. Repair of corrosion in RCC elements: Steps in repairing, Prevention of corrosion in reinforcement. Material placement techniques with sketches: Pneumatically applied (The gunite techniques), Open top placement, Pouring from the top to repair bottom face, Birds mouth, Dry packing, Form and pump, Preplaced aggregate concrete, Trowel applied method. Repair of DPC against Rising Dampness: Physical methods, Electrical methods, Chemical methods. Repair of walls: Repair of mortar joints against leakage, Efflorescence removal. Waterproofing of wet areas and roofs: Water proofing of wet areas, Water proofing of flat RCC roofs, Various water proofing systems and their characteristics. Repair of joints in buildings, Types of sealing joints with different types of sealants, Techniques for repair of joints, Repair of overhead and underground water tanks

Instructional Strategy

This is very important course and efforts should be made to find damaged/defective work spots and students should be asked to think about rectifying/finding solution to the problem. Visits to work site, where repair and maintenance activities are in progress can be very useful to students. The students will also prepare a project report based upon the available water proofing materials, sealant, special concrete for repair and adhesives and other repair material available in the market.

Recommended Books

1. Gahlot P.S. and Sanjay Sharma, “Building Defects and Maintenance Management”, CBS Publishers, New Delhi
2. Nayak, BS, "Maintenance Engineering for Civil Engineers", Khanna Publishers, Delhi
3. Ransom, WH "Building Failures - Diagnosis and Avoidance", Publishing E and F.N. Span
4. Hutchinson, BD; et al, "Maintenance and Repair of Buildings", Published by Newness – Butterworth

Rationale

Diploma holders in civil engineering have to supervise construction of various earthquake resistant buildings. Therefore, the students should have requisite knowledge regarding terminology of earthquake and the precautions to be taken while constructing earthquake resistant buildings

Detailed Contents**UNIT I**

Elements of Engineering Seismology : General features of tectonic of seismic regions. Causes of earthquakes, Seismic waves, earthquake size (magnitude and intensity), Epicentre, Seismograph, Classification of earthquakes, Seismic zoning map of India, Static and Dynamic Loading, Fundamental period.

UNIT II

Seismic Behaviour of Traditionally-Built Constructions of India .Performance of building during earthquakes and Mode of failure (Out-of-plane failure, in-plane failure, Diaphragm failure, Connection failure, Non-structural components failure)

UNIT III

Special construction method, tips and precautions to be observed while planning, designing and construction of earthquake resistant building. Introduction to IS: 4326, IS: 13828, IS: 1893(Part1), 154326 and IS: 13920 (latest edition)

UNIT IV

Seismic Provision of Strengthening and Retrofitting Measures for Traditionally-Built Constructions, Brick and RCC Structures

UNIT V

Disaster Management: Disaster rescue, psychology of rescue, rescue workers, rescue plan, rescue by steps, rescue equipment, safety in rescue operations, debris clearance and casualty management. Provision of reinforcement detailing in masonry and RC constructions

Instructional Strategy

The student may be taken for visit to various building construction sites where precautions related to earthquake resistant construction are being taken so that the students may appreciate the importance of the subject.

Recommended Books

1. Elements of Earthquake Engineering by Jai Krishana and AR Chandrasekaran; Sarita Parkashan, Meerut.
2. Manual Published by Earthquake Engineering department, IIT Roorkee / IIT Kanpur
3. IS 13920, IS: 13827, IS: 13828, IS 1893, IS 4326 (latest edition)
4. Singh, Harbhajan “ Earthquake Resistant Building Construction” Abhishek Publishers, Chandigarh

Rationale

Now a days, diploma holders in Civil Engineering have to supervise prestressed concrete construction. So, it is necessary that they should have basic knowledge of prestressed concrete.

Detailed Contents**UNIT I**

Introduction :Basic concept of prestressed concrete, advantages of prestressed concrete in comparison with RCC application of prestressed to various building elements, bridges, water tanks and precast elements

UNIT II

Materials: Materials requirement for prestressing concrete – High strength concrete, prestressing steel wires, strands and high strength bars. Stresses in high strength steel and stress-strain relationship, tendon profile

UNIT III

Prestressing Methods: Introduction to prestressing methods – pre-tensioning and post-tensioning, their suitability and comparison, circular prestressing and its application

UNIT IV

Bending and Shear Capacity :Concept of bending and shear capacity of prestressed members. Calculation of bending stresses in rectangular simply supported beams with straight and parabolic profile of tendons .

UNIT V

Losses in Prestressing : Types of losses in prestress – Elastic shortening, creep and shrinkage of concrete, friction loss and stress relaxation in prestress steel. Computation of losses for simple beam

UNIT I:

Architecture: Architecture & Civil Engineering, classical Architecture, contemporary Architecture, General aspects of Architectural projects. Architectural planning and design-Introduction, factors affecting Architectural Design, principles of Architectural design, organization of space, space standards, modular co-ordination.

UNIT II:

Functional analysis: Analytical study of Buildings in respect of functional efficiency, Architectural efficiency, Building Science, environmental controls-both exterior and interior, physical and economic constraints with respect to residential and Public buildings, DhajjiDewari and Takh System.

UNIT III:

Architectural plans and projects: Introduction to Architectural plans, preparation and reading of architectural plans, analytical study of various works/projects of some architects like LE Corbusier, Philip Jhonson, F.L.Wright, etc.

UNIT IV:

Town planning: Planning at various levels-national, regional, city, village.Origin & growth of towns, Horizontal and Vertical development. Brief historical review of some ancient towns, present day planning in India.

UNIT V:

Master plan & zoning: Importance of Master Plan for redevelopment of existing towns & planning of new towns, implementation, building Bye-Laws, concept of Red-hood Neighbourhood Pattern.Zoning Regulation for various urban land uses including density and height zoning, multi-story buildings and their implications on urban planning.

Books Recommended:

1. Architectural Design by KR Moudgil
2. Town Planning by Rangawala

3. Town Design by Fredrick Gibberd
4. New concepts in Architecture & design by Yoshikawa

UNIT I:

Construction Technology and various Construction methods. Construction equipment: Selection ,cranes, hoists, mixers, conveyors, vibrators, bulldozer, dumpers, trenchers, excavators, hoe, graders, piling hammers, pumps, compressors, bitumen mix plant, rollers, clam shell, aggregate production techniques, crushers.

UNIT II:

Project scheduling: Network planning and scheduling, resource leveling and allocation with examples using various techniques namely Bar chart; CPM and PERT.

UNIT III:

Engineering economics of projects: Depreciation; Sinking Fund; compound interest factors, Selection of most economical alternative by variable cost method/Cost benefit ratio. Owning and Operating cost.

UNIT IV:

Works accounting. Cashbook, Imprest cash, contractors bills, store accounts. Materials at site account. Indent, invoice, Debit & Credit note, suspense head stock, Engineering Statements, Form of agreement.

UNIT V:

Form work, Scaffolding, shoring, Shuttering and underpinning; their types, characteristics, performance and application to building processes.

Books Recommended:

1. Construction Methods Plant and Equipment by R.L. Purifoy
2. Building Construction by S.P. Arora & S.P. Bindra
3. Project Management by B.M. Naik
4. The practice of Construction Management by Barry Fayer.

UNIT 1

Earthquake, causes and classification, Estimation of size of earthquake, Magnitude and intensity, seismic waves, Isoseismal maps, Recurrence intervals, Fault slip rates, Response spectrum.

UNIT 2

Floods, causes of floods, Flood damages, Flood analysis and flood plain zoning, Drought and its impact.

UNIT 3

Cyclones and Tsunami, their causes characteristics and their impact, Prediction and control Measures, Avalanches – Mechanism, Classification, Control measures.

UNIT 4

Landslides - Mechanism, Causative factors, Landslides monitoring and prediction, Landslide hazard zonation.

UNIT 5

Vulnerability and Risk Management, Case studies for natural hazards, Various Retro-fitting Techniques.

Books Recommended:

1. Reiter, L Earthquake Hazard Analysis, Issues and Insights, Columbia University Press.
2. Hyndman D. and Hyndman D, Natural Hazard and Disasters, Brooks/cole.
3. Mileti D.S., Disasters by Design: A Reassessment of Natural Hazards in United States.