

B.Tech (Common to All Branch .)

Ist Semester

1. Communication skills
2. Physics (T & P)/ Chemistry (T & P)
3. Maths (T)
4. Fundamentals Computer (T)
5. W/S (T&P)
6. Analog Electronics

PROFESSIONAL COMMUNICATION

Unit – I : Technical Communication 8

Nature; Origin and Scope; Feature and General Writing; Significance; Style: Objective Style as Contrary to Literary Composition.

Forms of Technical Communication:

Reports: Types, Significance, Structure & Style of Report;

Writing of Reports: Project, Thesis, Dissertation Writing;

Technical Paper & Scientific Article Writing: Elements, Methods & Technical Objectives;

Technical Proposal: Nature, Divisions, Kinds, Uses.

Unit-II : Pre-Requisites of Technical Written Communication

Vocabulary Building : Homophones (Words Similar in sound but different in Meanings); Word-formation; One-Word

substitute; New & Select Vocabulary Building (about 500 words)

Functional Grammar : Patterns and Correct usage (Parts of speech); Syntax Concord; Prepositions; Articles.

Requisites of Good Sentence and Paragraph Writing: Requisites of Good Sentence Writing; Paragraph Writing; Unity,

Coherence and Emphasis; Development of Paragraph: Inductive Order, Deductive Order, Spatial, Linear, Chronological

Orders etc. with Emphasis on Argumentative & Expository Writing.

Unit : III : Business Correspondence: Principles; Features; Sales and Credit Letters: Letters of Enquiry, Quotation,

Order, Claim, Complaint and Adjustment letters, Bio-Data Making, Resumes/Job Application Processing.

Unit-IV : Language Learning Through Thematic and Value based Critical Reading (Non-Detailed Text Study) :

A Study of following Value-Oriented Essays:

A.L.Basham : The Heritage of India

S. Radhakrishnan : *The Gandhian Outlook*

Francis Bacon : *Of Studies*

J.B. Priestley : Making Writing Simple

Virginia Woelf : How should one Read a Book

R.K. Narayan : *A Bookish Topic*

C.E.M. Joad : The Civilization of Today

Study of following Short Stories for making the Students acquaint with the styles of great Writers of World:

O.H. Henry : The Gift of the Magi

R.N. Tagore : The Renunciation

Katherine Mansfield : *The Fly*

A.P. Chekhor : *The Lament*

M.R. Anand : The Barber's Trade Union

Ruskin Bond : The Eyes Are Not Here

D.H. Lawrence : The Rocking Horse Winner

Ernest Hemingway : The Capital of the World

Unit-V : Dimensions of Spoken English: Using English Language Laboratory :

Stress, Intonation, Rhythm, Phonemes, Allophones, Phonetic Transcription, Listening, Reading & Comprehension of Speech and Reproduction of Response.

Texts Books/ References

Singh R.P. (ed) : An Anthology of English Essay; OUP, New Delhi
Singh R.P. (ed) : An Anthology of English Short Stories; OUP, New Delhi.
Hornby A.S. : Guide to Patterns & Usage in English; OUP, New Delhi
Clark S. & Pointon : Word for Word; OUP, New Delhi
Rutherford A. : Basic Communication Skills; Person Education, New Delhi.
Singh R.P. : Functional Skills in Language & Literature; OUP, New Delhi
Bansal R.K. & Harrison : Phonetics in English; Orient Longman, New Delhi
Sethi & Dhamija : A Course in Phonetics & Spoken English; Prentice Hall, New Delhi.
Blum Rosen : Word Power; Cambridge University Press, New Delhi
Seely John : Writing Report; OUP, New Delhi

Suggested Readings :

Arora V.N. et al : Improve Your Writing; OUP Delhi
Mohan K. & Sharma R.C. : Business Correspondence of Report Writing; TMH, New Delhi.
Clive Upton et al : Oxford Dictionary of Pronunciation for Current English; OUP New Delhi.
A Dictionary of Modern English Usages; OUP, New Delhi
Michael Swan : Practical English Usages; OUP, New Delhi
John Alveybrideh : American English Pronouncing Dictionary; OUP New Delhi.
Jons Daniel : English Pronouncing Dictionary; Cambridge University Press.

PHYSICS

Unit – I : Relativistic Mechanics

Inertial and Non-inertial Frames, Michelson-Morley Experiment, Postulates of Special Theory of Relativity, Galilean and Lorentz Transformation, Length Contraction and Time Dilation, Addition of Velocities, Mass Energy Equivalence and Variation of Mass with Velocity.

Unit – II : Interference

Coherent Sources, Conditions of Interference, Fresnel's Biprism Experiment, Displacement of Fringes, Interference in Thin Films – Wedge Shaped Film, Newton's Rings.

Diffraction : Single and n-Slit Diffraction, Diffraction Grating, Raleigh's Criterion of Resolution, Resolving Power of Telescope, Microscope and Grating.

Unit – III : Polarization

Phenomenon of Double Refraction, Ordinary and Extra-ordinary Rays, Nicol Prism, Production and Analysis of Plane,

Circularly and Elliptically Polarized Light, Fresnel Theory, Optical Activity, Specific Rotation, Polarimeter.

Laser : Principle of Laser Action, Einstein's Coefficients, Construction and Working of He-Ne and Ruby Laser.

Unit – IV : Electromagnetics

Ampere's Law and Displacement Current, Maxwell's Equations in Integral and Differential Forms, Electromagnetic

Wave Propagation in Free Space and Conducting Media, Poynting Theorem.

Magnetic Properties of Materials

Basic Concept of Para-, Dia and Ferro-Magnetism, Langevin's Theory of Diamagnetism, Phenomenon of Hysteresis and Its Applications

Unit – V : X-Rays

Diffraction of X-Rays, Bragg's Law, Practical Applications of X-Rays, Compton Effect.

Wave Mechanics : Wave Particle Duality, de Broglie Concept of Matter Waves, Heisenberg Uncertainty Principle,

Schrödinger Wave Equation and Its Applications: Particle in a Box and One Dimensional Harmonic Oscillator.

References:

1. Robert Resnick : Introduction to Special Theory of Relativity
2. Arthur Beiser : Perspectives of Modern Physics
3. A.K. Ghatak : Optics

4. Wehr Richards & Adiaev : Physics of Atoms
5. O.Svelto : Lasers
6. D.J. Griffith : Electrodynamics

CHEMISTRY

Unit – I

1. Molecular theory of diatomic heteromolecules, Bond theory of bonding in metals, Hydrogen bonding.

2. Solid state Chemistry:

Radius Ratio Rule, Space lattice (only cubes), Type of unit cell, Bragg's Law, Calculation of Density of unit cell. One & Two Dimensional solids, graphite as two dimensional solid and its conducting properties. Fullerene & its applications.

Unit-II

1. Basic principles of spectroscopic methods. The use of UV, Visible, IR, ¹H NMR, for the determination of structure of simple organic compounds.

2. Characteristics and classification of polymers.

3. Structures of the following polymers, viz, Natural and synthetic rubbers, Polyamide and Polyester fibres, polymethylmethacrylate, poly acrylonitrile and polystyrene. A brief account of conducting polymers (polypyrrole & polythiophene) & their applications.

Unit-III

1. Stability of reaction intermediates, e.g. Carbanion, Carbocation and free radicals. Types of organic reactions, &

Mechanism of nucleophilic substitution reaction.

2. Mechanism of the following reactions.

(i) Aldol condensation. (ii) Cannizzaro reaction (iii) Beckmann rearrangement (iv) Hofmann rearrangement, and (v) Diels-Alder reaction

3. E-Z Nomenclature. Optical Isomerism of organic Compounds containing one chiral center. Examples of optically active compounds without chirality. Conformations of butane.

Unit-IV

1. Order & Molecularity of reactions. First & Second order reactions. Energy of activation.

2. Phase Rule: Its application to one component system (Water).

3. Equilibrium Potential, electrochemical cells (galvanic & concentration cells), Electrochemical theory of corrosion & protection of corrosion.

Unit-V

1. Hardness of water, softening of water by Lenny-S process & Reverse osmosis. Treatment of boiler feed water by

Calgon process, Zeolites and ion-exchange resins.

2. Classification of fuels, Coal, Biomass & Biogas. Determination of gross and net calorific values using Bomb Calorimeter.

3. Environmental pollution : Types of pollution & pollutants, Air Pollution. Formation and depletion of ozone, smog and Acid rain.

References :

1. Organic Chemistry (Morrison & Boyd)
2. Inorganic Chemistry (I.D. Lee)
3. Physical Chemistry (Barrow)
4. Environmental chemistry (Manahan)

MATHEMATICS-I

Unit - I : Matrices

Elementary row and column transformation, Rank of matrix, Linear dependence, Consistency of linear system of equations, Characteristic equation, Caley-Hamilton Theorem, Eigen values and eigen vectors, Diagonalisation, Complex and unitary matrices .

Unit - II : Differential Calculus- Leibnitz theorem, Partial differentiation, Eulers theorem, Curve tracing, Change of variables, Expansion of function of several variables

Unit - III : Differential Calculus- Jacobian, , Approximation of errors, Extrema of functions of several variables, Lagranges method of multipliers (Simple applications).

Unit - IV : Multiple Integrals Double and triple integral, Change of order, Change of variables, Beta and Gamma functions, Application to area, volume, Dirichlet integral and applications.

Unit - V : Vector Calculus

Point functions, Gradient, divergence and curl of a vector and their physical interpretations, Line, Surface and Volume integrals, Greens, Stokes and Gauss divergence theorem.

Fundamentals of Computer

Introduction : Classification of computer and generation, Basic architecture of computer and its building blocks, Input devices, Computer memories.

Number System : Binary, Octal, Decimal, and Hexadecimal representation of characters : ASCII and EBDIC codes, Binary arithmetic and logic circuit.

Classification of Computer language : Machine, Assembly and High level language, Brief idea of operating system, Assembler, Compiler and interpreter.

Fundamentals of computer programming : Problem solving through computer algorithms and flow chart level of programming.

Operating system : Introduction to O.S., Types of operating system, Multiprogramming, Timesharing, Batch, Real time and UNIX

Internet : Introduction to internet, Components, Services and working on internet, **introduction to protocols, tools.** Workshop Practice Study & Perform on various M/C . Conducting job work by using various M/C, Cutting tools, equipments & hand tools i.e. files, chisels, hacksaw, right angle, marking tools measuring tools, etc.

Analog Electronics

Turbulent flow through conduits; lift and drag; pipe networks; boundary layer theory; open channel flow; uniform and varied flow; hydraulic jump; elements of sediment transport; introduction to hydrology and hydrological cycle; elements of meteorology; precipitation; mean depth of rainfall over area; evaporation, transpiration and evapotranspiration; interception and infiltration; run off and factors affecting run-off; unit hydrograph; methods of determination of run-off.

IInd Semester

1. Physics (T & P)/ Chemistry (T & P)

2. Engg. Graphics
3. Workshop Practice (T&P)
4. Thermodynamics
5. Computer Programming – I (T & P)
6. Engineering Mechanics
7. Maths-II

Semester 2nd

PHYSICS

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Inertial and Non-inertial Frames, Michelson-Morley Experiment, Postulates of Special Theory of Relativity, Galilean and

Lorentz Transformation, Length Contraction and Time Dilation, Addition of Velocities, Mass Energy Equivalence and

Variation of Mass with Velocity.

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2. Inorganic Chemistry (I.D. Lee)
3. Physical Chemistry (Barrow)
4. Environmental chemistry (Manahan)

Engineering Graphics

Programming techniques, review of programming languages useful to civil engineering works, structural analysis concepts, modeling of problems, relation between elements and systems, programming with and flexibility and stiffness matrix displacement plain stress/strain problems, eigen value problems, programming for pre and post processor, civil engineering computer projects.

Workshop Practice

Study & Perform on various M/C . Conducting job work by using various M/C, Cutting tools, equipments& hand tools i.e. files, chisels, hacksaw, right angle, marking tools measuring tools, etc.

Thermodynamics

: Fundamental Concepts and Definitions

Definition of thermodynamics, system, surrounding and universe, phase, concept of continuum, macroscopic & microscopic point of view. Density, specific volume, pressure, temperature. Thermodynamic equilibrium, property, state, path, process, cyclic process, Energy and its form, work and heat, Enthalpy. 3

Laws of thermodynamics

Zeroth law: Concepts of Temperature, zeroth law. 1

First law: First law of thermodynamics. Concept of processes, flow processes and control volume, Flow work, steady flow energy equation, Mechanical work in a steady flow of process. 2

Second law: Essence of second law, Thermal reservoir, Heat engines. COP of heat pump and refrigerator. Statements

of second law. Carnot cycle, Clausius inequality. Concept of Entropy. 3

: Properties of steam and thermodynamics cycles:

Properties of steam, use of property diagram, Steam-Tables, processes involving steam in closed and open systems. Rankine cycle. 4

Introduction to I.C. Engines-two & four stroke S.I. and C.I. engines. Otto cycle, Diesel cycle.

Computer Programming –I (C Language)

1. Introduction :

- a. Scope of C Language
- b. Distinction and similarities with other HLLs
- c. Special features and Application areas

2. Elements of C

- a. Character Set
- b. Key Words
- c. Data Types
- d. Constants and Variables
- e. Operators unary, binary, ternary
- f. Operator precedence

3. Console Input-Output

- a. Types of I-O
- b. Unformatted console I-O: getchar(), Gets(), Puts(),
- c. Formatted I-O : Scanf(), Printf()

4. Control Flow :

- a. Statements and blocks
- b. if
- c. Switch
- d. Loops : For, While, Do-While
- e. Go to and labels

5. Arrays :

- a. Basic Concepts

b. Memory Representation

- c. One Dimensional Array
- d. Two Dimensional Array

- e. Three Dimensional Array
6. **Functions :**
 - a. Basic concept
 - b. Declaration and prototype
 - c. Calling
 - d. Arguments
 7. **Pointers :**
 - a. Basic Concepts
 - b. &,* operator
 8. **Structure, Union and Enumerated Data Types**
 - a. Basic Concepts
 - b. Declarations and Memory Map
 - c. Elements of Structures
 9. **File Handling :**
 - a. Types of Files
 - b. File Organization
 - c. Opening, Reading, Writing, Closing

Engineering Mechanics

Force system and Analysis

Basic concept: Laws of motion. Transfer of force to parallel position. Resultant of planer force system. Free Body Diagrams, Equilibrium and its equation.

Friction: Introduction, Laws of Coulomb friction, Equilibrium of bodies involving dry friction-Belt Friction.

Structure Analysis

Beams: Introduction, Shear force and Bending Moment, shear force and Bending Moment Diagram for statically determinate beams.

Trusses: Introduction, Simple Trusses, Determination of Forces in simple trusses members, methods of joints and method of section.

Center of Gravity

Center of Gravity and Moment of Inertia, Polar Moment of Inertia, C.G and M.I of composite section, section modulus

Math-II

Complex numbers, analytic functions, Cauchy's theorems, elementary functions , function, Series expansions, calculus, of residues and application. Vector space, basis and dimension, transformation, row reduction method and it application t linear system.

IIIrd Semester
1. Digital Electronics (T & P)
2. Mechanics of Solids
3. Data Structure & Algorithm (T&P)
4. Electrical Science-I
5. Control System (T & P)
6. Maths-III
7. Hydraulic & Fluid Mechanics

Digital Electronics

1. **Number system & Code** :- Weighted code; Non weighted code, Radix & Radix conversion; sign & magnitude Representation , complement Notation .
Fixed point arithmetic : BCD Addition, Subtraction multiplication & Division
2. **Boolean algebra and digital logic gates** : Features of logic Algebra, postulates of Boolean algebra. Theorems of Boolean algebra . Boolean function derived logic gates. Exclusive –OR, NAND Logic gate conversion.
3. **Minimization techniques** : Minterm, Maxtrm , Karnaugh Map. K Map upto 4 Variables. Simplification of logic function with K. map Variable mapping .
4. **Combinational and Sequential systems** : Combinational logic ckt design, Half and full adder sub tractor, Binary serial and Paroled adders, BCD adder, Binary Deluder, BCD to Decimal, BCD to 7 Segment decoder, MUX, Demux , Encoder.
Latches, Tip. Flops , R.S.D. J.K.T Flip flops. Master slave flip flops. Counters asyrichronous Registers, Counters.

Mechanics of Solids

Stress and Strain Analysis

Simple stress and strain: Introduction, Normal shear stresses, stress-strain diagrams for ductile and brittle materials,

Elastic constants, one dimensional loading of members of varying cross sections, strain Energy. **3**

Compound stress and strains: Introduction, state of plane stress, Principal stress and strain, Mohr's stress circle.

Pure Bending of Beams: Introduction, Simple Bending theory, Stress in Beams of different cross sections.

Torsion: Introduction, Torsion of Shafts of circular section, Torque and Twist, Shear stress due to Torque.

Maculies Methrod Column & Strut Thick & Thin Cylinder

Data Structure & Algorithms

Introduction to software design principles, modularity, abstract data types, data structures and algorithms; Analysis of algorithms; Linear data structures – stacks, arrays, lists, queues and linked representations; Pre-fix, in-fix and post-fix expressions; Recursion; Set operations; Hashing and hash functions; Binary and other trees, traversal algorithms, Huffman codes; Search trees, priority queues, heaps and balanced trees; Sorting techniques; Graphs and digraphs; Algorithmic design techniques; Data structures for external storage, multi-way search and B-trees.

Electrical Science-I

Introduction :- Current, Voltage, Resistance, Effect of Electrical Energy, Ohms's Law

D.C Circuits :- Series circuit, Parallel circuits, Series-Parallel Circuit, Kirchoff's Law, Mesh Analysis, Nodal analysis.

Network Theorems :- Superposition Theorem. Delta Star & Star Delta Transformation.

A.C Fundamentals:- Generation of Alternating Voltage & Current, Basic terms, Average Value R.M.S Value, Peak Factor, Form factor

Measuring Instruments:- Electrical Instruments, Essentials of Indicating Instruments, Moving Non Instruments, instrument type Single Phase Energy meters.

Control System Engineering

- 1. Concept of control system :-** Examples and application of open loop and closed loop systems, differential equations. Determination of transfer function & Signal flow graph method
- 2. Time Response Analysis and Frequency Domain:** Method study state error & error specification in frequency domain and their correlation with time Domain. Bode plot Design specification in frequency domain and their correlation with time domain.
- 3. Stability of the system:** Absolute stability and Relative stability Routh's stability criterion Hurwitz criterion-root locus method of analysis Polar plots Nyquist stability criterion M and N loci Nyquist chart .

State variable analysis : Z Transform and state variable and state Model- solution of state equation . Concepts of Controllability & operability.

Maths-III

Differential Equations:- Eigen-values and eigen-vectors. Inner product space and orthonormal bases. Elementary differential equations. Hypergeometric equations, Legendre polynomials. Bessel functions, Fourier series, Sturm-Liouville terms of first order equations. Laplace transformation and applications to differential equations one dimensional wave equation, one dimensional heat equation and equation in rectangular form.

Hydraulics & Fluid Mechanics

Text Reference	S.W. Yuan, Foundations of Fluid Mechanics Prentice Hall, 1969. V.L. Streeter, Fluid Mechanics McGraw Hill, 1976. A.L. Prasuhn; Fundamentals of Fluid Mechanics, Prentice Hall, 1980.
Description	Introduction, fluid characteristics, continuum concept, properties of fluids, fluid statics, flow kinematics, control volume equations, flow analysis, solution of Navier-Stokes equations for some special cases, boundary layer theory, dimensional analysis.

IVth Semester
1. Optimization
2. Introduction to Auto Mobile Engg.
3. Electrical Science-II
4. Introduction to Environmental Engg.
5. Fundamental of Surveying
6 Principles of Management

Semester 4th

Optimization

Optimization of functions of one and many variables with and without constraints; Kuhn-Tucker conditions; gradient methods; linear programming; simplex based and integer programming methods; duality theory; transportation and assignment problems; dynamic

programming; branch and bound methods; models of linear production systems, sequencing and scheduling, PERT, CPM

Introduction to Automobile Engineering

Text Reference	E.F. Obert, Internal Combustion Engines- Analysis and Practice, International Text book, 1965 M. Khovakh, Motor Vehicle Engines, Mir, Moscow, 1979.
Description	Constructional features and performance characteristics of petrol and diesel engines, Performance at high altitude and supercharged state. Theory of combustion, Study on inlet and exhaust systems. Fuel systems of petrol and diesel engines. Governing of engines.
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Syllabus Electrical Science-II

A.C Circuit :- A.C Through Pure R, L& C Circuit, RL Circuit RC Circuit, RIC Circuit Series Resonance Parallel Resonance, Q Factor.

Induction Machine :- Introduction Principle of D.C Generator and Motor, Construction, Types of D.C Machine, EMF Equation.

Synchronous Machine:- Introduction, Principle of Synchronous Speed of Number of Poles, Construction, advantages of Rotating field system over Stationary field System.

Transformer :- Basic Principle of Transformer, E.M.F Equation, Construction, Types of T/F Transformer on No Load, Transformer on Load.

Introduction to Environmental Engineering

Introduction, environmental pollution, noise, noise pollution, water pollution, air, air pollution, water quality management, pollution caused by an industry, selection of site of an industry, assessing environmental impact, case studies, computer applications, laboratory tests. Water Treatments, Solids Waste Management, Composting

Fundamental of Surveying

Introduction, different types of surveying instruments, measurement of length and area, chain surveying, obstructions in chaining and its remedy, measurement of horizontal and vertical angles, height of an object, dumpy level and its application, standard bench mark, reduced level, measurement of reduced level of a point and ground, reduced level at different locations of theodolite, plane table ground for construction of road, building, pond and other structures, field tests.

Principles of Management

1. Nature and importance of management
2. Principles of management
3. Planning
4. Organizing
5. Staffing
6. Directing Supervision
7. Control

B. Tech Civil Engg. Syllabus

Vth Sem.

Design of Concrete Structure:- Introduction, types of cement, aggregate, components of concrete, mix design and its philosophy, design of singly and doubly reinforced beams, flanged beam columns, foundations, walls, other components of buildings, other important reinforced concrete structures, methods for reinforced concrete design, pre-stressed concrete, laboratory tests.

Analysis of Structure :- Introduction, indeterminate structures virtual work and energy principle, slope deflection method, Maxwell's reciprocal theorem, rolling loads

and influence lines, moment distribution method, kani's method, stiffness and flexibility approach, finite element approach, plasticity theory and its applications for structures, for structures laboratory experiments.

Geo technical Earthquake Engineering :- Introduction, earthquake and its effect, magnitude and intensity of earthquakes, faults, seismometers and accelerometers, properties of soil during and after earthquakes, geo technical earthquake hazards and its remedy (e.g ground improvement, ant liquefaction measures), earthquake resistant design of geo technical structures, prediction of earthquake, Indian Standard Code as design tool for earthquake resistant design.

Computer Aided Civil Engineering Drawing:- Introduction, AutoCAD-an introduction, types of structures, plan, elevation, sectional view of super and sub structures, foundation layout for super-structures, detailed drawings for each components of such structures, step wise construction based on drawings.

Soil Mechanics: - Introduction, definitions different types of soil, clay mineralogy, soil structures, permeability, seepage, capillarity, compaction, consolidation, shear stress, total and effective stress in soil, earth pressure, arching in soil stresses in soil due to external load bulk heads types of bulk heads, free earth support method, fixed earth support method, stability of slopes, pavement design, foundation types, bearing capacity and settlement of foundations, field and laboratory investigations of soil.

Geodesy:- Introduction measurements in field, mapping, basic theory of measurements, triangulation, tachometry, astronomical survey, photogrammetry and error analysis, field tests.

VIth Sem.

Computer Application in Civil Engineering: - Introduction an introduction to FORTAN, C, C++, software to be used in Civil Engineering, Programming and analysis of continuum and discrete structures, stiffness and flexibility methods, Eigen value and eigen vector, pre and post processing, graphical user interface, application of software in civil Engineering.

Properties of Civil Engineering Materials :- Introduction, building stones and aggregates, clay products i.e bricks, tiles, terracotta, etc, lime cements mortars, concrete, timber, plywood and allied products, plastics and allied products glass and allied products, paints and allied products, ferrous, non- ferrous metals and alloys, gypsum and allied products adhesives i.e glues, asphalt bitumen, felts, blast furnace slag, flashy, concrete hollow blocks, coal, tar, pitch and linoleum.

Design of Steel Structures :- introduction, riveting and welding, tension members, compression members, members under bending, members under axial load and moment, eccentrically loaded members, design of trusses, gantry girders, plate girders base for columns and footing, industrial structures, plastic, design of structures.

Transportation Engineering :- Introduction, transport systems, its characteristics, social and economical factors, planning and design of transport facility, design standards, design of highway, railways and airports, different types of intersections, traffic safety and traffic management, laboratory tests.

Water and water Treatment :- Water and waste water treatment Introduction, water supply and waste water system, analysis of water and waste water, requirements for treatment & treatment process, design of treatment units, disposal of sludge of waste

water, design of sewerage systems, water distribution networks, rural sanitation, reunification of effluent and its reuses.

Numerical Analysis :- Introduction, Solution of non linear algebraic equations, Interpolation & approximation, differentiation & integration, system of linear equations, Eigen values & Eigen vectors problems, round off and conditioning.

VIIth Sem.

Introduction to Water Resource Engineering :- Introduction, hydrology, irrigation methods, determination of water required for crops, analysis of run off, hydrographs, confined and unconfined aquifers, determination of discharge, reservoir types and its planning, mass curve, life of reservoir, cost aspects, flood routing, design analysis of dam.

Design of Water Resource System :- Introduction, planning water resources, flood and flood routing, spillways, weirs on permeable foundation, exploration of ground water, well hydraulic, pumping tests. Masonry works, construction .

Contract Specification and Quantities :- Introduction, specifications for different quantities estimation of earthwork, quantities of cement, sand and gravel for massive concrete work, steel and other estimations, evaluation of cost for different quantities, schedule of rates, sanction, project, technical report, accounts and procedure of works, planning of colony and village housing.

Design of Bridge Structures:- Introduction, types of bridge, design and analysis of important bridges, design and analysis of important foundations for bridges.

Computer Aided Design :- Introduction, brief introduction to programming languages, computer graphics knowledge based expert system, database management system, web page design, pre and post processing, application in engineering and science.

Design of Pre- stressed Concrete Structures :- Introduction, pre- tensioned and post-tensioned members, pre- stressing systems, losses in pre-stress, design of pre-stress members under flexure, shear and torsion, pre-stress transfer, load balancing techniques.

Disaster Management :- Introduction, hazard and its types, effect of natural and man made hazards, preparedness, prevention, mitigation, warning and management for natural and man made hazards, rehabilitation and reconstruction, education and training for disasters, case studies, application of computer for analyzing disasters.

VIIIth Sem

Construction Planning & Technology :-

Expert Systems :- Introduction, Components of an expert system, stages in expert system development, knowledge representation, inference mechanism, Knowledge based approaches for engineering and science design, building expert systems, applications.

Earth Quake Engineering :- Introduction single degree of freedom system, multi degree of freedom system, magnitude and intensity of earthquake, seismometers and earthquake zones of different countries, design earthquakes, earthquake resistant design as per Indian Standard code, seismic soil- structure interaction, geo technical earthquake engineering disaster management for earthquakes.

Foundation Engineering :- Introduction types of foundations, bearing capacity of shallow foundations, bearing capacity of deep foundations, stresses in soil immediate and long term settlement of foundations, drainage and dewatering, construction of foundations static dynamic seismic soil- foundation structure interaction.

Project Work:-

Contact to the concerned project guide.