

Structure of S.E 2003 COURSE :-

Semester -I

Subject Code No	Subject	Teaching Scheme			Examination scheme			
		Hours /week			Marks			
		Lect	Tut.	Prac /Drg	Paper	Term work	Pract .	Oral
201001	Engg. Mathematic –III	4	--	-	100	--	-	--
201002	Building Materials and Construction	4	-	4	100	25	-	50
201003	Strength of Material	4	-	2	100	-	-	50
201004	Engg. Geology	4	-	2	100	25	50	-
201005	Economics and Management	3	-	-	100	-	-	-
201006	Communication Skills and Technical Visits	1	--	2	-	25	-	--
	Total	20	--	10	500	100	50	100
Total Marks = 750								

Semester -II

Subject Code No	Subject	Teaching Scheme			Examination scheme			
		Hours /week			Marks			
		Lect	Tut.	Prac /Drg	Paper	Term work	Pra ct.	Oral
201007	Fluid Mechanics I	4		2	100	25		50
201008	Building Planning and Built Environment and Drawing	3	-	4	100	25	-	50
201009	Surveying I	4	-	4	100	25	50	-
201010	Concrete Technology	3	-	2	100	25	-	-
201011	Theory of Structure I	4	-	-	100	--	-	-
	Total	18		12	500	100	50	100

Total for Part II :750 Marks	Grant total of part I & II:1500 Marks
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Detail S. E. Syllabus

201001 BUILDING MATERIALS AND CONSTRUCTION

Teaching Scheme

Examination

Scheme

Lectures - 4 hrs./week

Paper :100

Marks (3 hrs.) Practical's - 4 hrs/week

Term Work: 25 Marks

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SECTION - I

UNIT - 1:

(8Hrs)

Introduction to building construction.

Substructure - Functional requirements. Bearing capacity of soil and rock, necessity and concept of site investigation. Foundation types - shallow and deep and their suitability, setting out and layout of foundation plan, damp-proof course, basement construction, plinth filling and soling, under pinning.

UNIT - 2:

(8 Hrs)

a) Stones: - Requirements of good building stones, IS specifications and tests on stones. Stone masonry principal terms, detailing of constructions - procedure for VCR and CR masonry, mortar preparation, types of mortar, Pointing Purpose and types.

b) Brick and block masonry: - Characteristics of good building bricks, IS specifications and test. Classification of bricks- silica, refractory, fire etc. Brick work - terms, types of bonds - English, Flemish, Stretcher and Header. Construction procedure, supervision, openings in walls, mortar preparation. Block masonry - Hollow and solid, cavity wall construction, scaffolding - types.

UNIT - 3:

(8Hrs)

Doors and Windows: - Functional requirements, materials of doors and windows, types, glazing, method of

fixing doors and windows, fixtures and fastenings.

b) Arches and Lintels: - Principle of arch-action, types of arches, method of arch construction, centrifugal and renewal. Lintels - necessity and types, chujjah / weather shade - necessity and types

c) Protective coatings: - Plastering types and application, mortar, Painting and varnishing, types and application

White washing, distempering, oil paints. Wall cladding - materials, methods of fixing, wall papering and glazing work.

UNIT - 4:

(8

Hrs)

a) Flooring: - Materials, Tests and IS specifications, ground and upper floors. Flooring - functional requirements

of flooring material, varieties of floor finishes and their suitability, construction details for concrete, tiles and stone flooring

b) Roofing - Materials GI, AC, fiber sheets, Mangalore tiles. Roof construction - types and their suitability, method of construction, types of trusses, types of shell structures, space and frame structures.

UNIT - 5:

(8Hrs)

a) Vertical circulation: - Considerations in planning, design and construction, Stairs- types, materials, fire

resisting materials, design of stair, details of ramps, ladders, lifts and escalators.

b) Industrial construction: - Steel construction - General, purpose of steel work, sections for structural steelwork. Methods of connecting steel sections - bolting, riveting, welding, structural steel member and their connections
Tubular structures

UNIT - 6:

(8Hrs)

a) Miscellaneous materials - Properties, types and uses of following materials - lime, Ferrous metals, Polymers.

Plastics types, Mastic, Gypsum. Ferro-Crete, Clay Tiles and Glazed ware, Plaster of Paris, Artificial one Timber - Types and properties. seasoning, testing Glass - Types and properties. Aluminum and alloys properties.

b) Safety in construction – Safety on site. storage of materials, construction safety, prevention of accidents

c) Repairs and Maintenance - Additions and alterations, strutting and shoring

TERM WORK:

It shall consist of the following

a) Free hand sketches:

1. Types of foundation - 1 plate.

2. Many & one and brick = I + I plate.

3. Types of door - detailed plan, elevation and section - 1 plate.

4. Types of window - 1 plate.

5. Types of stairs - 2 plates.

6. Types of arch - 1 plate.

7. Types of steel trusses - 1 plate.

8. Steel - column to beam or beam to beam connection - 1 plate.

9. Roofing - trusses.

b) One Seminar Report and presentation on various aspects of construction and materials

c) Computer based sketching and drawing for **any Four** sketches mentioned in a).

TEXTBOOKS

I. Building construction - Bindra and Arora

II. Building construction - B. C. Punmia

III. Materials of Construction - Ghosh, Tata McGraw Hill
Pub. Delhi

REFERENCE BOOKS

1. Building construction - B8ITid, McGraw Hill Pub. Delhi.

2. Civil Engineering Materials - TTTI Chandigrah, Tata McGraw Pub.

3. Building Materials Technology - Brantly Tata McGraw Pub.

4. Properties of Concrete - A. M. Neville

5. Properties estimation and Control of Engg. Material- Cordon, Tata McGraw Pub.

6. Building Construction - Mitchell

7. Building construction - Rangawala.

201007 BUILDING PLANNING AND BUILT ENVIRONMENT

Teaching Scheme

Examination Scheme

Lecture :-3 hrs/week

Paper:- 100

Marks(4 hrs) Practicals - 4 hrs/wee

Term Work: 25 Marks

Oral:- 50 Marks_

Section - I

UNIT – I :

[16Hrs]

1)Planning of building – Principle planning of buildings principles of

Architectural design - form function, utility, aesthetics. Integrated approach

In built Environment – Civil Engg. Architecture and allied Engineering services.

2. Building rules and bylaws necessity of laws, plot sizes, road widths, open spaces.

Flore area ratio (F.A.R.), marginal distance, building lines, control line, height regulation, room sizes. Type of area calculations - built-up area. Carpet area floorer area ,Rules of ventilations, lighting, drainage. sanitation and parking of vehicles.

3.Landscape elements and element of interior decoration.

UNIT-2:

1.Climate - Design of buildings for different climatic conditions [16 hrs]

2 Principles of thermal design - Comfort factors, heat exchange of buildings - calculation of heat loss and gain, heat transfer loads, units of heat transfer, calculation of 'U' values, temperature gradient. Thermal deign orientation with respect to thermal design, layout of buildings , deign of shading devices thermal performance of Control, thermal insulation roofs and walls.

3.Ventilation - Comfort factors Natural ventilation – necessity of ventilation, stack effect wind effect orientation with respect to ventilation , calculation of window areas mechanical ventilation - objective selection of ventilation system , ventilation rate *Air* conditioning - necessity, design

data, comfort factors- calculation of air conditioning, cooling load , air distribution, air conditioning systems

4.Lighting: - Principles day lighting, Design of windows, Sky Component E.RC, orientation . artificial illumination supplementary illumination

UNIT-3:

[16Hrs]

1. Noise and acoustics: - effect of noise, Comfort standards, noise Control, Sound insulation Acoustics -reverberation , Sabine's formula, acoustical defects, conditions of good acoustics, Sound absorbents, for various types of buildings

2.Fire protection fire safety, load grading of occupancies by fire load. considerations in fire protection grading properties of fire resistance construction walls & column , roofs and floor wall opening, fire escape elements.

3) building Services- Importance of building Services, constructional requirement of different buildings services electrical, telecommunications and entertainment services, plumbing services, layout of water supply and

drainage system, storage and disposal arrangement. Septic tanks, garbage disposal arrangement.

Section - II

UNIT -4:

Planning of residential building Load bearing / framed structure a) Bungalows b) Row houses c) ownership flats d) Apartments .

UNIT -5:

Planning of public buildings – Framed structures . Functional requirements of public buildings. Following types of public building may be consideration for planning-

Educational building, hostel building with rectors and servants quarters, lodge / hostels building primary health center with hospital staff quarters. Factory building – Administrative blocks and factory . bus stand , Library building, shopping complex , Health club , Marriage hall, Auditorium , Multiplex , Sport complex, Restaurant , Vegetable Market , Post office , Bank And any other .

UNIT - 6

Perspective Drawings :- one point and two point prospective drawings.

TERM WORK

a) Students will prepare working drawings or any type of building from the list given in section II (Unit IV or Unit V) of the syllabus

Working drawing: - Scale 1: 50 or suitable,

1. Layout plan

2. Plan/typical floor plan, (by hand as well as by Auto CAD)

3 Elevation (by hand as well as by Auto CAD)

4. Foundation plan

5. Sectional elevation,

6) Parking plan,

7) Axonometric view / prospect view

8) Water supply and drainage layout

b) Report file It shall Consist of

- 1) Data given for the project
- 2 Analysis or the program
- 3) Planning Consideration & line plans
- 4 Approximate Cost of the building

c) Report regarding visit to one Construction site

Oral examination shall include (Free hand sketching):- Total Marks - 50

. Sketching Time - 30 min, Marks - 20

. Oral Marks - 30

TEXT BOOKS

1) Building Drawing with and Integrated Approach - Shah, Kale, Patki
Tata McGraw Publication

2) National building Codes- 1986

REFERENCE BOOKS

1. Building Design and Constructions – Mentt, Tata McGraw Publication

2 Times Savers Standards Of Architectural Design Data - Callender, Tata
McGraw Publication.

201005 COMMUNICATION SKILLS AND TECHNICAL VISITS

Teaching Scheme

Examination Scheme Lectures - I hr./week

Term Work: 25 Marks

Practical - 2 hrs/week

a) Introduction:-

(1 Hr)

Necessity for developing communication skills and conducting site visits,
principles of communication, barriers to communication, business
communication

b) Non-verbal communication:-

(1 Hr)

Body language, personal appearance, posture, gestures, facial expression, face to face conversation, eye contact, space distancing.

c) Meetings:-

(1 Hr)

Agenda, notices, minutes of meeting, procedure, chairmanship, participation from individuals; necessary physical arrangements.

d) Group Discussions:-

(1 Hr)

Purpose, group behavior, role of observer, regulating the speech, use of persuasive Strategies, time management, interview techniques.

e) Technical Writing Skills:-

(1 Hr)

Difference between synopsis and abstract, points to be covered in the synopsis, abstracting from papers, concept of literature review, report writing.

f) 7 habits of highly effective people:-

(4 Hr)

Be proactive, begin with end in mind, put first things first, think win-win, seek first to understand and then be understood, synergy, sharpen the saw.

g) Virtual site visits:-

(3 Hr)

Making use of audio-visual aids in the form of videos and CD's and also explaining case studies associated with various construction works.

Term Work

a) Practical

1. Technical Quiz 1 turn

2. Group Discussion

1 turn

3. Technical Debate

1 turn

4. Conduct of Meeting

1 turn

5. Technical Games

1 turn

6. One visit to any organization related to civil engineering for studying its organizational structure, methods or working, report keeping etc.

7. One visit to any construction site wherein the actual line out is in progress

8. One visit to any construction site to study the shuttering and reinforcement pattern

9. Before During casting or slab or any other stage of Construction .

10. 2 visits to any *of* the major Civil engineering projects

b) **Journal**

1. Detailed visit report should be written in proper format including photographs for anyone of the visits made.
2. Minutes of the meeting conducted to be attached.

3. Reference material obtained during other visits to be photocopy and studied.

Reference Books

1. W. W.S. Bhaskar and N.S.Prabhu, "English Through Reading," Vol.-I and II, Mac Millan Publishers, 1978.
2. Eunice D'Souza and G.Shahani, "Communication Skills In English," Noble Publishing House, 1977
3. RC.Sharma and K.Mohan, "Business Correspondence and Report Writing", rata McGraw Hill, New Delhi, 1994.
4. Stephen Covey, "7 Habits Of Highly Effective People".

201009 CONCRETE TECHNOLOGY

Teaching Scheme

Examination

Scheme

Lectures - 3 hrs./week

Paper:

100 Marks (3 hrs.)

Practicals - 2 hrs/week

Term

Work: 25 Marks

SECTION - 1

Unit 1: Ingredients of Concrete

(6 hr)

a) Cement - Manufacture of Portland cement, Basic chemistry of cement, Hydration of cement, Classification of cement, Types of cement - super sulphate cement and blended cement, Tests on cement.

b) Aggregate - Classification, Mechanical Properties, Physical properties, Deleterious Materials, Soundness, Alkali-aggregate reaction, Sieve analysis, Grading curves, Tests on aggregate, Artificial and Recycled aggregate.

c) Water - Mixing Water, Curing water, Tests on water.

Unit 2: Concrete

(6 Hrs)

a) Fresh Concrete:-

1) Workability: Factors affecting workability, cohesion and segregation, bleeding, workability tests.

2) Mixing, Handling, Placing and Compacting concrete.

3) Curing- Methods of curing, Influence of temperature, Maturity rule, Steam curing.

b) Hardened Concrete:-

1) Strength of concrete - Factors affecting Strength, Micro-cracking and stress-strain relation, other strength properties, Relation between tensile and compression Strlngths, Impact Strength, Resistance to abrasion.

2) Elasticity and creep, Shrinkage and swelling.

Unit 3: Concrete Mix Design

(6 Hrs)

Factors to be considered, Statistical quality control, Methods of Mix Design IS- (10262, 456) and DOE.

SECTION - II

Unit 4: Special Concretes and Special Concreting Techniques [6

Hrs]

a) Special Concrete:-

Light weight concrete, Polymer concrete.

Fiber reinforced concrete: Types of fibers, Factors affecting properties, Applications. High-density concrete, High performance concrete, self compacting concrete

b) Special Concreting Techniques:-

Pumping of concrete, Under-water concreting, Cold-weather concreting, Hot-weather concreting, Ready mixed concrete, Vacuum concrete, Roller compacted concrete, FeITo-cement.

Unit 5: Admixtures and Testing of concrete

(6 Hr)

a) Admixtures:- Functions, Classification, Types - Mineral and Chemical. IS Specifications - (9103 and 456). Compatibility of Admixtures, Marsh Cone test.

b) Testing on concrete:- Analysis of fresh concrete, strength tests, test cores.

Non Destructive Testing - Reround hammer, Ultra Sonic Pulse Velocity, Pullout test, Impact cx:ho t~1.

Unit 6: Deterioration and Repairs

(6 Hrs)

a) Deterioration:- Pemleability and Durability, Chemical Attack, Sulphate attack, Attack by Seawater, Acid attack, Chloride attack, Carbonation of concrete and its determination, Corrosion of reinforcement.

b) Repairs:- Symptoms and Diagnosis of Distress, Evaluation of cracks, Selection of repair procedure, Repair of defects, common types of repairs, Short Crete.

Term work:

Term work shall consist of a journal giving a detailed report of experiments and site visits of the following

A) Experiments

1) Cement: Standard Consistency, Initial and Final Setting time, Finales test by air permeability method, Compressive Strength, Soundness test.

2) Aggregate (Fine and Coarse): Specific Gravity and Density, Sieve Analysis., Flakiness and Elongation, Moisture content, Aggregate Impact and Crushing value.

3) Fresh Concrete:

a) Workability: - Slump test, Compaction factor and Vee-Bee test.

b) Effect of Admixtures: - Effect of retarders on sting time, Effect of plasticizers on workability

4) Hardened Concrete: Compressive Strength, Tensile strength, Modulus of rupture, Determination of Modulus of Elasticity, Demonstration of Rebound Hammer and ultra Sonic Pulse Velocity tests, Determination of Carbonation depth.

5) Concrete Mix Design by IS Code Method.

B) At least one site visit and short report there 00. Text Books:

1. Concrete Technology - M. L. Gambhir, Tata McGraw Hill Publications,

2. Concrete Technology - M. S. Shetty, S. Chand Publications.

Reference Books

I. Concrete Technology - A. M. Neville, J. J. Brooks, Addison
Wesley

II. Properties of Concrete - A. M. Neville, Longman Publishers.

III. Concrete Technology - R.S. Varshney, Oxford and mH.

IV. Concrete - P Kumar Mehta, Gujrat Ambuja.

201004 ENGINEERING ECONOMICS AND MANAGEMENT

Teaching Scheme

Examination

Scheme

Lectures - 4hr./week

Paper: 100 Marks

(3 hrs.)

SECTION - I (ENGINEERING ECONOMICS)

Unit 1: Introduction, Demand and Supply

a) Introduction [3
Hrs]

I Introduction to Engineering Economics, Definition, Principles, Importance. Introduction to Investment, Assts, Liabilities, Wealth, Goods, Wants. Difference between Cost, Value, price and its relevance to Marketing Utility. Law of Diminishing Marginal Utility.

b) Demand and Supply [3
Hrs]

Demand, Demand Schedule, Law of Demand, Demand Curve, Elasticity of Demand. Supply, Supply Schedule, Supply Curve, Elasticity of Supply, Law of Substitution. Equilibrium, Equilibrium Price, Equilibrium ,Amount, Factors affecting Price Determination

Unit 2: Economic Environment and Production Resources

a) Economic Environment of Business [3
Hrs]

Business Cycle, Life Cycle of Product, Laws of Returns. Perfect Competition, imperfect Competition, Monopolistic Competition. Introduction to Gross National Product, Gross Domestic Product. Introduction to Tools for Engineering Economics

b) Resources and Productivity

[3

Hrs]

Resources of Production, Factors of Production, Land, labor, Capital, organization, Materials, Machinery. Concept of Productivity and its Improvement Concept of Resource Scarcity and hence need for Optimization. Economics of Size, Large Scale Production, Small Scale Production.

Unit 3: Basic Concepts of Finance

[6Hrs]

Definition of Money. Rent, Simple and Compound Interest, Profit Annuities. Capital Types of Capital. Working and Fixed Capital. Introduction to Capital Generation: - Shares, Debentures, Public Deposits, Foreign Capitals, Mutual Funds, Concept of Build Own Transfer (BOT). Concepts of Inflation and Deflation of Currency', Credit, Types of Taxes related to Machinery and Materials. Elements of Cost - Prime Cost, overheads, total Cost Concept of Depreciation only, Cost Break-Even Studies. Types of cost - Material, Labor, Machinery etc, Cost Control, SEBI, RBI, foreign Exchange, Mechanism of Foreign Exchange, Insurance.

SECTION - II (MANAGEMENT)

Unit 4: Introduction to Management and Organizational Development

a) Introduction to Management [3

Hrs]

Definition of Management Importance of Management, Functions 01'

Management ,Managerial Objectives Evolution of Scientific Management,

Contribution by Taylor, Contribution by Henry Fayol Deming's PDCA

Cycle

b) Organizational Development

[3 Hrs]

Importance of Organization. Characteristics of Organization. Principles of

organization, Authority. Delegation of Authority. Types of organization -

Line, Functional, Line and Staff. Ownership, Types of ownership-

Proprietary, Partnership, Joint Stock Company, Cooperative Organization

Public sector, Private Sector, joint Venture

Unit 5: Human Resources Management and Decision Making

a) Human Resources Management

[3 Hrs]

Nature and scope of HR Planning, Training and Development, Recruitment and Selection Motivation - Types and Nero, Reward and Punishment, Leadership Styles,

b) Decision Making

[3 Hrs]

Decision Making - Introduction and Definition. Types, Techniques and Processes, Methods. Concept at Cost- Benefit. Analysis (Problems are to be solved).Concept of Decision Tree (Problems are to be solved),

Unit 6: Elements of Industrial Management

[1 Hrs each

for A to D]

a) Industrial Psychology :- Aims and objectives of Industrial Psychology, Theory X and Y,

b) Industrial Disputes :- Trade Unions. Industrial Disputes, Strikes, Settlement of Industrial Disputes.

c) Work Study :-Introduction to Work Study, Introduction to Time and Motion Study.

d) Management of Information Technology :- Management of Information Technology /MIS through case Studies,

e) Total Quality Management : Concept of TQM, Deming's 14 Principles, Principles of Quality Management Zero Defect, KAIZIEN, KANBAN, House of Quality, Quality Circle [12 Hrs]

Text Books:

1) O. P Khanna, Industrial Engineering and Management:-
Dhanpat Rai Publications

2. T. R. Banga, S. C Sharma, Industrial organization and Engineering economics:- Khanna Publishers

Reference Books:

1. Koontz H, Wehrich H; Essentials of Management , Tata McGraw
Hill Edition

2. M. Y. Khan, P. K. Jain, Financial management. Tata McGraw,
Hill Edition

3 Juran Gryna. Quality Control, Tata McGraw
Hill Edition

4. S. N. Chary', Production and Operations Management, Tata McGraw
Hill Edition

5. James Riggs, David Bedworth. Sabah Randhawa, Engineering
Economics. Tata McGraw Hill Edition

6. Gary Dessler, Human Resources Management, Pearson
Education

7 James A. O'Brien. Management of Information System, Tata
McGraw Hill Edition

201006 FLUID MECHANICS - I

Teaching Scheme Scheme

Lectures - 4 hrs./week
(3 hrs.)

Examination

Paper 100 Marks

Practicals - 2 hrs/week

Term

Work: 25 Mark

Oral :

50 Marks

SECTION-1

Unit 1:

a) Properties of Fluids

[5

Hrs]

Physical properties of fluids - density, specific weight, specific volume, relative density, Newton 's Law of Viscosity, dynamic and kinematics Viscosity, Classification of fluid, Rheological diagram, Newtonian and Non-Newtonian fluids, ideal and real fluids, compressibility, cohesion, adhesion, surface tension, capillarity, vapor pressure

b) Dimensional Analysis and Model studies

[3 Hrs]

Dimensions of physical quantities- Dimensional homogeneity, Dimensional analysis using Buckingham's (pai) theorem, important dimensionless

parameters and their significance. Geometric Kinematics and Dynamic similitude, Model laws, Types of models, Applications of dimensional analysis and model studies to fluid flow problems.

Unit 2: a) Fluid Statics

[4 Hrs]

The basic equation of hydrostatics, Concept of pressure head Measurement of pressure datum (absolute, gauge), Application of the basic equation of hydrostatics, Piezometers, Simple and differential manometers, inclined manometers, Introduction to pressure transducers, Total pressure, Center of pressure, Total pressure and Center of pressure for plane and curved surface- Pressure diagrams, Practical applications { gates, dams, Lock gates).

b) Buoyancy and floatation

[4 Hrs]

Principle of floatation and Buoyancy, Equilibrium of floating bodies, Stability of floating bodies, Metacentre , Met centric height and its determination (experimental and analytical), Stability of submerged bodies- Relative Equilibrium of liquids - liquid masses subjected to uniform linear acceleration and rotation.

Unit 3:

a) Fluid Kinematics

[4Hrs]

Methods for describing the motion of fluid, Velocity and acceleration of fluids. Types of flow - steady and unsteady, uniform and non-uniform, laminar and turbulent, one, two three-dimensional flows in Cartesian coordinates. Control volume, Stream lines, Stream tube, Path lines, Streak lines, Equation of continuity for three dimensional flow in Cartesian coordinates, Equation of continuity for one-dimensional flow along a streamline, Rotational and irrotational motions, Circulation and Velocity, Velocity potential, Stream function and Flow net, Methods of drawing flow net. use- and limitations of flow net.

b) Fluid Dynamics

[4

Hrs]

Forces acting on fluid mass in motion, Euler's equation of motion along a streamline and its integration, Assumptions of Bernoulli 's equation, Kinetic energy correction factor Hydraulic Grade line and Total Energy line, Linear momentum equation and momentum correction factor, Angular momentum Applications of Continuity. Bernoulli and Momentum equations

SECTION - II

Unit 4: a) Applications of Bernoulli's Equation

(3 Hrs)

Flow through orifices and mouthpieces under free and submerged condition, Venturimeter, Orifice-meter, Nozzle - meter, Rota-meter and Pitot tube

b) Flow over Notches and weirs

(3 Hrs)

Classification of notches and weirs, Discharge over a sharp & crested rectangular notch, velocity of approach, end contractions, Discharge over a triangular notch, trapezoidal notch, cippoletti notch. Ventilation of weir, Time required emptying a tank

Unit 5:

a) Laminar Flow

[4hrs]

Reynolds Experiment, Laminar flow through a circular pipe, Flow between two fixed parallel plates, Stokes' law, Methods of measurement of viscosity, Flow through porous media, Darcy's Law, Transition from laminar to turbulent flow

b) Boundary layer Theory

(4 Hrs)

Development of boundary layer on a flat plate. Nominal, displacement and momentum thickness. Laminar, turbulent and transitional boundary layer, Application of momentum equation for boundary layer development, Local and mean drag coefficients, Hydro-dynamically smooth and rough boundaries, Boundary layer separation and its control.

Unit 6:

Turbulent Flow

(4 Un]

Characteristics of turbulent flow, Instantaneous velocity, Temporal mean velocity, Scale of turbulence and intensity of turbulence, Semi-empirical theories to estimate shear stresses in turbulent flow- Boussinesq's theory, Prandtl's mixing length theory. Velocity distribution in turbulent flow, Prandtl's velocity distribution equation, Karman Prandtl's velocity distribution equations for smooth and rough boundaries, Equation for mean velocity for pipes, Darcy Weisbach's Equation, Variation of friction factor for laminar flow and for .smooth rough turbulent flow; Nikuradse's experiments on artificially roughed pipes, Friction factor for commercial pipes Moody's diagram, explicit equation for friction factor.

b) Flow through pipes

I 4 Hn]

Energy losses in pipe flow (major losses and minor losses), flow through pipes such as simple, compound, parallel, branched pipes and siphons, Dupits equations, Hydraulic transmission of power through pipes, Introduction to three-reservoir problem and pipe network.

Practical Work

Any Eight experiments out of the following List of Experiments

I Measurement of viscosity

2. Study of pressure measuring devices

3. Study of stability of floating bodies

4. Flow net by electrical analogy for flow below weir (With and without Sheet pile)

5. Study of Bernoulli's theorem with reference to losses of energy

6. Calibration of venturi meter /orifice meter

7. Calibration of orifices/notch

8. Study of laminar flow using Reynolds's apparatus and Helshaw's apparatus

9. Study of laminar and turbulent flow through pipes

10. Study of minor losses in pipe flow

Assignments (both compulsory)

1 Flow net by graphical method.

2. Assignment on use of Computer program/ spread sheet/ solver for trial and error solution of three-reservoir problem or solution of pipe network by Hardy- Cross method.

Term work

Term work will consist of a journal giving the detailed report of experiments and assignments performed.

Oral Examination

Oral examination will be based on the term work of the candidate

Text Book

I. 'Hydraulics and Fluid Mechanic - Modi and S.M. Seth Standard
Hook house 1998

2. 'Fluid Mechanics - Garde- Mirajgaonkar, SCITCH
publication

Reference Book

1. Fluid Mechanics by Streeter and Wylie, Tata- Mc hill
Publication 1997.

2. Fluid Mechanics with Engineering applications' Daugherty, Franzini and
Fennimore, (SI Metric edition by K. Subramanya),
McGraw Hill Book CO 1989

3 'Fluid Mechanics' by B.F. White McGraw Hill, 1994.

4 'Mechanics of Fluids' by Irving Shames McGraw Hill
publications.

207001 MATHEMATICS-III

Teaching Scheme

Examination Scheme

Lectures - 4 hrs./week

Paper: 100 Marks (3 hrs.)

SECTION-I

Unit I: (9 Hr)

Linear Differential Equations (LDE): - General nth order LDE solution of nth order LDE with constant coefficients particular integral by variation of parameters, Cauchy's & Legendre's differential equation, solution of simultaneous & symmetric simultaneous differential equations.

Unit 2: (8 Hr)

Applications of differential equation: - Applications of LDE to problems on bending of beams, whirling of shafts and mass spring systems, applications of partial differential equations PDE

Applications of PDE to problems of Civil and allied engineering

Unit 3: (9
Hr)

Numerical Methods: - Numerical solutions of

(i) System of Linear equations by Gauss Elimination, Choleski and Gauss-Seidel methods

(ii) Ordinary Differentials Equations by Euler's, Modified Euler's, Runga-Kutta 4th order and Predictor Corrector methods.

Section II

Unit 4: (9 Hr)

Statistics and Probability: - Mean, Mode, Median. Standard deviation, \variance, Coefficient of variation, Moments, Skew ness and Kurtosis.

Bivariate distribution, Correlation and Regression, Reliability of Regression estimates. Introduction to Probability, Theorems and Properties, Probability

distributions viz. Binomial, Poisson, Normal, Hyper Geometric, Chi -Square test. Test of Hypothesis, decision and quality control

Unit 5:

(9 Hr)

Vector Calculus: - Vector Differentiation & its physical interpretation
Radial, Transverse, Tangential & Normal Components of Velocity and
Acceleration. Vector differential operator Gradient, Divergence & Curl.
Directional derivative, Vector identities.

Unit 6:

(8 Un)

Vector Analysis: - Line, Surface & Volume integrals. Work done.
Conservative, Irrotational & Solenoidal fields. Scalar potential Gauss's,
Stoke's & Green's theorems (without proofs). applications to problems in
Fluid Mechanics, Continuity equations, Stream lines, Equations of motion,
Bernoulli's equations

Text Books:

1. Advanced Engineering Mathematics, 5th Edition – Peter's ,V, O'Neil
(Thomson Learning).

2. Advanced Engineering Mathematics - Erwin Kreyszig
(Wiley Eastern Ltd.).

Reference Books:

I. Advanced Engineering Mathematics - Wylie C.R & Barrett L.C.
(McGraw-Hill. Inc.)

2. Higher Engineering Mathematics - B S. Grewal (Khanna
Publication, Delhi).

3. Advanced Engineering Mathematics, 2nd Edition - M D Greenberg
(person Education).

4. Engineering Mathematics - E V. Raman (Tata
McGraw-Hill).

5. Applied Mathematics (Volumes I and II) - P N. Wartikar &.P.
N Wartikar (Pune Vidyarthi Griha Prakashan. Pune)

6. Advanced Engineering Mathematics with MATLAB, 2nd Edition -
Thomas, L. Harman, James Dabney and Norman Richert
(Books/Cole, Thomson learning).

201003 ENGINEERING GEOLOGY

Teaching scheme

Examination scheme

Lectures: 4 hrs / week

Paper:

100 marks (3 hrs)

Practical: 2 hrs./week

Term work: 25

marks

Practical:

50

marks

marks

SECTION I

Unit-I

[3hrs]

Petrology

introduction

and General Geology: Introduction to the subject, object, scope and sub divisions. Surface relief of the earth, external and internal agents modifying the earth, weathering, erosion, Detritation and decomposition. Earth movements metamorphism volcanism.

Petrology:

[1hr]

Rocks and minerals Silicate and Non silicate minerals, Rod forming minerals, Primary and Secondary minerals, essential and accessories minerals

Igneous Rocks:

[2hrs]

Mineral composition, felsic and Mafic minerals, Textures, Reasons for textural variation Crystalline variation, crystalline matter and glass, degree of crystallization. and shape and size of crystal on condition of cooling. Condition of cooling of plutonic, hypabyssal and volcanic rocks. (Gas cavities and secondary infillings in volcanic rocks. Classification of igneous rocks. Study of common rock types prescribed in practical work

Secondary Rocks and Sedimentary

deposits:

[2hrs]

Rock weathering decomposition and disintegration favorable conditions, process, and products of Decomposition and disintegration Classification, residual, Sedimentary, Chemical and organic Deposits. Agents of transport. Textural characteristics of aqueous, Aeolian and glacial deposits. Clastic Texture Stratification and lamination. Current bedding. Features of. shallow

water deposit Consolidation by welding and cementation. Grain size classification study of common rock types

Metamorphic rocks:

[2hrs]

Agents and types of metamorphism. Metamorphic textures. Contact, Cabalistic, Dynamo thermal and plutonic me lamorphism Study of common rock types.

Unit II-

Structural Geology:

Structural Geology

[7hrs]

Outcrop. Dip and strike. Conformable series. Unconformity and overlap. Different types of Faults and folds in rocks. Inliers and Outlier. Modes of occurrence of igneous. rocks Joints, Fractures and their engineering characters Mountains- Mountain building activity, organic and epirogenic processes.

Unit III

Geomorphology and Historical Geology -

(07hrs)

Geomorphology:

Geological action of running water, river valley development, normal cycle of river. erosion, Regional cycle of river erosion waterfalls, ox-bow lakes, flood plain deposit, delta, Rejuvenation and Resulting features such as canyons, river terraces and incised meander

Volcanism, Geological aspects of Coast Lines

[1 hr]

Historical Geology. (3hrs)

General principles of stratigraphy, Age of the earth and divisions of the Geological time. Physiographic divisions of India and their characteristics. Geological history of Peninsula. Study of formations in Peninsula and the significance of their structural characters in major Civil engineering activities, economic minerals

SECTION-II

Unit IV-

Preliminary Geological Explorations and State of Art Techniques in

Engineering Geology:

Preliminary Geological Explorations.

(7hrs)

Use of Geological maps and sections, Verification of surface data by subsurface exploration, Drill holes, test pits, trenches, exploratory tunnels, shaft", adits, drifts, etc. Compilation and interpretation of information obtained from these, Correlation of surface data with results of subsurface exploration Limitations of drilling. Comparative reliability of data obtained by drilling and excavation. Engineering significance of Geological structures such as stratification, dips, folds, faults, joints, Fractures.. crushed zones, fault zones, dykes, etc. Case histories.

State of all techniques in Engineering Geology..

(3hrs) Computational Engineering geology, GIS, Remote Sensing and its applications. Mapping Techniques in Engineering Geology.

Unit V-

Ground water, Building Stones and Stability of Slopes

Ground water .. (3hrs)

Types of Ground water, Water table and depth, zones of saturation Relation between surface relief and

Water table. Influence of textures and Structures of rocks on groundwater storage and movement, Pervious and impervious rocks (Geological work of groundwater, effects of solution and deposition.

Geological conditions favorable for natural springs and seepage, depression and contact Springs Hot springs and geysers, Wells and drill holes
Fluctuations in water table levels, Effects of dams and canals, effect of pumping, cone of depression, circle of influence. Conservation of groundwater. Artesian wells- Geological conditions that produce Artesian Pressure Water bearing capacity of common rocks, Locating groundwater supplies.

Building stones..

[2hrs]

Requirement.. of good building stone. Dependence of strength, durability, Ease of dressing, availability of blocks of suitable size and appearance on mineral composition Textures and field structures Suitability of common rocks as building stone.

Stability of Slopes.

[2hrs]

Causes, Role of water, stability, of slopes in consolidated material, influence of dip and slope, safe and unsafe slopes, Prevention of landslides, keeping slopes from water, retaining walls Vegetation, slops treatment, Precautions to be taken while aligning roads etc. across hills and making cuts in hill slides. Case histories

Unit VI-

Tunneling, Dams and Reservoirs

Tunneling:

(6hrs)

Influence of geological conditions on design and construction methods, Preliminary Geological investigations for tunnels. Important Geological considerations while choosing alignment Difficulties during tunneling as related with lithology, nature and structures of material to be excavated. Role of groundwater. Geological conditions likely to be troublesome. Suitability of common rock types. For tunneling. Unlined tunnels Case histories.

Geology of Dam Site:

[3hrs]

Dependence of strength, stability and water tightness of foundation rocks and their physical Characters and Geological structures. Influence of geological condition on the choice of type And design of dams Preliminary geological work on dam sites. Favorable and unsuitable Geological conditions for locating a dam. Precaution to be taken to counteract unsuitable Condition, Treatment of leaky rocks faults. dykes, crush zones, joints, fractures, unfavorable Dips, etc. Earth quakes in regions of dams. Case histories.

Geology of Reservoir sites:

(Ibr]

Dependence of water tightness on physical properties and structure of rocks. Geological condition suitable and unsuitable for reservoir sites. Conditions likely to cause leakage through resevoirs rims. Importance of ground water studies and effects of rising of the water table. Case histories. Etc.

Seistcity in Project Area:

(Ibr]

Earth movements, Earthquakes, Interior of the Earth, earthquake zones, Geological considerations for choosing sites of building in seismic area.

Text book

1. R.B Gupte: A Text Book of Engineering Geology- P. V G. Publications, pune
2. M.Anji.Reddy: A Text Book of Remote Sensing and Geographical information System -2nd Edition 2001 BS Publication
3. N.Chenna Kesavlllu: A Text book of Engineering Geology.

Reference Books

1. R.Legget Geology and Engineering - McGraw Hill Book Co., London

FGH Blyth, and MH. De Freitas Geology for Engineers, ELBS

List OF EXPERIMENTS

1. Identification of following mineral in hand specimens:

Quartz and its varieties, common varieties of cryptocrystalline and amorphous silica, orthoclase, plagioclase, muscovite, biotite, zeolites, calcite, ice land spar, gypsum, satinspar, fluorite. barites, tourmaline, beryl, graphite, asbestos, talc, kyanite, garret, galena, magnetite, hematite, limonite, iron pyrites, chromite bauxite, azurite, malachite, psilomelane.

2. Identification of the following rock types in hand specimens:

Granites, syenites, diorites, gabbros, rhyolites, trachytes, andesites, basalts, varieties of Deccan trap rocks, volcanic breccias, pegmatite, dolerites, granitic granites. Limestones, bauxites, conglomerates, breccias, sandstone, quartzite, grits, arkose, shales mudstone. Chemical and organic limestone. Marbles, quartzite, varieties of gneisses, slates, phyllite. and varieties of schists

3. Construction of geological sections from contoured geological maps, interpreting geological features without drawing section. solution of engineering geological problems such as alignment of dams, tunnels, roads, Canals, bridges, etc. based on geological maps

4. Logging of drill core and interpretation of drilling data Graphical representation of core log.

5. One site visit is desirable to study local geology and its engineering applications.

Practical Work :

Mineralogy 2 practicals

Igneous rocks : 1 practicals

Secondary rocks 2 practicals

Metamorphic rocks 2 practicals

Geological maps 10 practicals

Engg. Geological problems 2 practicals

Core logging 2 practicals

6. Term Work:

Term work will consist" of handwritten journal giving details of the experiments performed

7. Practical Exam:

The practical exam. shall be based on the above practicals performed in the lab.

201010 THEORY OF STRUCTURES-I

Teaching Scheme

Examination

Scheme

Lectures 4hrs/wrek

Paper: 100 Marks

(3 hrs)

SECTION - I.

UNIT I

A) Basic concepts of Structural Analysis -

[02hrs]

Types and Classification of structures based on structural form - Skeletal Structure , Surface Structures, Solid / 3d Structures, Plane frames and Plane trusses, Space frames and Space trusses.

Concept of indeterminacy and degrees of freedom - Static and, Kinematics degree of indeterminacy Methods of finding degrees indeterminacy for various types of structures.

B) Concept of strain energy, strain energy due to axial gradual, suddenly and impact loadings and due to bending moment and tensional moments

(02hrs)

C) Deflection of determinate structures by application of Castigliano's first theorem

Deflection of beams, Deflection of rectangular portal frames

[04hrs]

UNIT- II

A) Analysis of Indeterminate Beams by Compatibility Methods, Maxwell's theorem of reciprocal displacements and Betti's law, Analysis of Propped Cantilevers and Fixed Beams, Analysis of Continuous Beams by Theorem of Three Moments up to 3 unknowns only' [04hrs]

B) Analysis of indeterminate structures by application of Castigliano's Second theorem, Beams with indeterminacy up to 2 degrees. Rectangular portal frames will, indeterminacy up to 2 degrees.

(04hrs)

UNIT- III

A) Deflections of Determinate Trusses by Castigliano's First Theorem

[04hrs]

B) Analysis of Redundant Trusses by Castigliano's, Second Theorem. lack of fit and temperature changes in members, sinking of supports. Degree of indeterminacy maximum up to 2 only. [04hrs]

SECTION - II

UNIT - IV

Analysis of indeterminate Structures by Displacement Methods

Continuous beams and non-sway rectangular portal frames, sinking and rotational yielding at support with indeterminacy' up to 3 degrees. Only prismatic sections over a given span shall be considered.

A) Slope deflection method -

(04hrs)

B) Moment distribution method -

(04hrs)

UNIT - V

Influence lines and rolling loads

A) Basic Concept of Influence lines, construction of Influence lines diagrams for support reactions, SF and BM at a given section of simply supported beams, overhanging beams and compound beams

Muller-Breslau's principle and its application to above beams

(02hrs)

B) Rolling loads-

Use of Influence line diagram for determination of SF and BM in beams due to UDL shorter than span, UDL longer than span, two concentrated loads at some distance apart. series of concentrated loads and conditions for maximum SF and maximum BM values.

Condition for maximum BM under a chosen load, determination of absolute maximum SF and BM. Absolute maximum BM diagram, Concept of

Equivalent UDL

[04hrs]

C) Influence line diagram for axial forces in members of Plane Determinate Trusses Uses of influence Line diagram for determination of member forces of plane determinate trusses under Dead load and Live load

[02hrs]

Unit - VI

Arches - Concept of arch, linear arch and types of arches.

A) Three hinged arches - influence line diagram for Horizontal Thrust at support, Radial Shear, Normal Thrust and BM at a cross section. Parabolic and Semicircular arches **[04hrs]**

B) Two hinged arches - Horizontal Thrust at support, Radial Shear, Normal thrust and BM at a cross

Section. BM diagram for concentrated load and UDL. Parabolic and Semicircular arches **[04hrs]**

TEXTBOOKS

1. Mechanics Of Structures Vol. II- Junnarkar and Shah. (Charotar Publication - 16thEdition)

2. Basic Structural Analysis by C S Reddy, Tata McGraw Hills.

3. Intermediate structural analysis- C. K. Wang, Mc Graw Hill Publication.

REFERENCE BOOKS

1. Theory of Structures by Pandit and Cjupta, Tata McGraw Hill Publieation
2. Theory Of Structures - Timoshenko And Young (:Mc Graw-Hill Pub, 2nd IEdition)
3. Structural Analysis - R.C Hibbeler - (Pearson Education Asia Pub. 5th Edition)
- 4.Elementary Structural Analysis - Norris, Wilbur In1d Utku. (TMH Pub. - 4th Edition)
5. Structural And Structures Analysis - T.G.H Megson (Arnold Publ.)

201002 STRENGTH OF MATERIALS:

Teaching Scheme

Examination

Scheme

Lectures - 4 hrs./week
(3 hrs.)

Paper 100 Marks

Practicals - 2 hrs/week

Term Work: 25 marks

Practical: 50 Marks

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SECTION-I

Unit 1:

a) Concept of stress and strain (linear, lateral, shear and volumetric),
Hook's law, elastic constant and their relationship, Stress-strain diagrams
for ductile and brittle materials, factor of safety and working stress,
generalized Hooke's law.

[4hrs]

b) Axial force diagram, stress, strains and deformations in determinate: and
indeterminate homogenous and composite bars under concentrated loads,
self-weight and temperature changes.

[4 hrs]

Unit 2:

a) Shear force and bending moment diagrams: - Concept and deflection of SF and **BM** in beams due to concentrated load, udl, uniformly varying loads and couples in determinate. Beams Relation between SF, **BM** and intensity of loading, construction of SF and BM diagrams for cantilevers, simple and compound beams and bents.

[4 hrs]

b) Stresses due to bending: - Theory of simple bending. Concept and determination of Moment of Inertia of cross-sections, assumptions, Derivation of flexure formula, Bending stress distribution diagrams, Moment of resistance of cross section, Filched beams [4hrs]

Unit 3:

a) Shear stress distribution in beams: - Concept, derivation of shear formula, shear stress. Distribution diagrams for common sections, maximum and average shear stress shear connectors [4hrs]

b) Torsion of Circular Shafts: - Theory of torsion of shafts of circular cross section, assumptions, derivation of torsion formula, stresses, strains and deformations in determinate and indeterminate shafts of hollow, solid, homogenous and composite cross-sections subjected to twisting moments, Power transmitted by shafts, Twisting moment diagrams

[4hrs]

SECTION - II

Unit 4:

a) Principal stresses and Principal strains: - Normal and shear stress on any oblique plane, concept of principal planes and principal stresses, derivation of principal stresses, maximum shear stress Orientation of principal planes by analytical and graphical methods (Mohr's circle of stress 2-D).

[5hrs]

b) Combined effect of axial stresses, bending moment, shear and torsional moments, Theories of failure -

Maximum normal stress, maximum shear stress, and maximum strain theory

(3 hrs)

Unit 5:

a) Direct and bending Stresses: - Concept, short column and other structural components Such as retaining walls, dams, chimney's etc, Effect of lateral force and self-weight, stress diagrams due to axial loads, uniaxial, and biaxial bending, no tension condition, concept of core of section for standard symmetrical sections.

(4 hrs)

b) Axially loaded columns: - Concept of critical load and buckling, derivation of Euler's formula for buckling load with hinged ends, concept of equivalent length for various end conditions, Rankine 's formula, safe load on Column, limitations of Euler's formula. (4 hrs)

Unit 6:

a) Slope and deflection of determinate beams: - Concept and definition, relation between bending moment, slope and deflection, slope and deflection by double integration method under point load, udl and concentrated moment. (3 Hrs)

b) Slope and deflection in determinate beams by Moment Area Method and Conjugate beam Method. (5 Hrs)

Text Books:

1 Mechanics of Structures Vol I - Junnarkar, Advani, Charotar publication.

2 Mechanics of materials - Gere and Timoshenko, CHS publishers

Reference Books:

- 1 Introduction to Mechanics of Solids - J.B. Popove. Prentice - Hall publication.
- 2 Strength of Material - F. L. Singer and Pytel, Harper and Row publication
- 3 Mechanics of Material - Beer and Johnston, Mc Graw Hill publication
4. Mechanics of Materials - Andrew Pytel, Jaan Kiualaas, Thomson Learning

Practical Work: it shall consist of the following experiments and assignments.

1. Tension test on mild steel, tor-steel, and aluminum
2. Shear test on mild steel and aluminum.
3. Torsion test on mild steel and cast iron
4. Impact test on mild steel, aluminum, copper, brass, and Cast iron.
5. Hardness test on mild steel, copper, aluminum, brass and cast iron
6. Bending test on timber and plywood compression test on timber, bend-rebend test on mild steel and tor-steel and flexure test on mild steel

7. Tests on bricks: -compressive strength, water absorption and efflorescence test.

8. Tests on tiles: - flexural strength of flooring and roofing tiles, abrasion test of flooring tiles-cement and marble mosaic

9. At least 4 problems from four different units of *Strength of Material* syllabus to be solved using either programming, or Spreadsheets or solvers or any

Term work:

Term work will consist of a journal giving the detailed report of experiments and assignments performed

Oral Examination:

oral examination will be based on the term work carried out by the candidate.

201008 SURVEYNG -I

Teaching Scheme

Examination

Scheme

Lectures - 4 hrs./week
(3 hrs.)

Paper 100 Marks

Practical's - 2 hrs/week

Term Work: 25 Marks

Drawing- 2 hrs/week

Practical:

50 Marks

SECTION -I

Unit 1: Study of Dumpy Level and Theodolite

(8 Hrs)

a) Study of Dumpy level, Auto level.

b) Principal Axes of Dumpy Level, Testing and adjustment of axis of bubble tube and line of collimation, reciprocal leveling, curvature and refraction correction, distance to the visible horizon.

c) Study of Venire and Micro-optic theodolite, Introduction to 20" Venire Theodolite.

d) Principal axes of theodolite, Testing and Permanent adjustments of Transit theodolite.

Unit 2: Theodolite Traversing

(8 Hrs)

a) Uses of Theodolite - Measurement of Horizontal angles, horizontal angles by repetition and by reiteration (errors eliminated) ,vertical angles, magnetic bearings, prolonging a line, lining in, setting out angles

b) Theodolite Traversing - Computation of Consecutive and independent co-ordinate adjustment of closed traverse by Transit rule and Bowditch's rule, Gales Traverse table, omitted measurements, area calculation by independent co-ordinate.

c) open Traverse - Its uses, measurement of deflection angles using transit theodolite, open traverse survey, checks in Open traverse.

Unit3: Tachometry

(8 hrs)

a) Principle of stadia fixed hair method with vertical staff to determine horizontal distances and elevations of the points.

b) Use of Tachometry in Surveying, Tachometric Contour Survey

c) Contouring - Use of contour maps, direct and indirect methods of contouring.

d) Profile Leveling - Longitudinal sections and Cross-sections.

e) Study and use of Topo-sheets.

SECTION - II

Unit 4: Curves - I

(8 hrs]

a) Introduction to Horizontal and Vertical Curves and their purposes.

b) Simple Circular Curves - Elements and setting out by linear and angular methods , obstacles in setting out curves

Unit 5: Curves – II

(8 hrs)

- a) Compound Curves - Elements of and Setting out compound curves.

- b) Introduction to Reverse Curves - Elements, locations and use.

- c) Transition Curves - Types and uses, Length of Transition curve , Elements of cubic parabola, length of combined curve, computation of data required for setting out the combined curve, setting out the combined curve by linear and deflection angle method.

Unit 6: Plane Table Survey

[8 hrs]

- a) Equipments required for plane table survey, uses, advantages, disadvantages and errors in plane table surveying

- b) Methods of plane table survey - Radiation, intersection, traversing and resection.

c) Two point and Three point problems and their solutions by different methods, strength of fix, Lehman's rules

d) Introduction to different construction survey - route survey, survey for buildings, pipelines, sewers and tunnels.

Note: Due emphasis should be given to numerical problems

Term work: It shall consist of list of practical exercises and projects for Surveying - 1 as detailed below.

1) Study and use of dumpy level and auto level to determine elevations of various points.

2) Measurement of horizontal and vertical angles by transit theodolite.

3) Measurement of horizontal angles by repetition method

4) Project I - Theodolite traverse survey project of a closed traverse with at least four stations, computation of area of the traverse.

5) Computation of horizontal distances and elevations by tachometry.

- 6) Project II- Tachometric contouring project with two instrument stations about 60 m apart.
- 7) Radiation and intersection methods in plane table survey
- 8) Project III - Plane table survey project of a close traverse with at least 4 stations with details such as buildings, roads, etc
- 9) Setting out a given building from a given foundation plane.
- 10) Setting out a circular curve by Rankine's method of deflection angles or by offsets from chords produced.
- 11) Project IV - Road project for a minimum length of 300 m including fixing of alignment, profile leveling, cross-sectioning, plotting of L-section and cross-section
- 12) Writing the program or use of software for anyone of the exercises listed above.

Text Books:

- 1) Surveying and Leveling Vol. I and Vol. II – T .P.Kanetkar and SV.Kulkarni
- 2) Surveying Vol I – Dr.B.C,Punmia

3) Surveying Vol I I -
.Jain, Arun K.Jain

Dr.B.C,Punmia, Ashok K

Reference Books:

1) Plane and Geodetic Surveying for Engineers Vol I - Devid Clark

2) Principles of Surveying Vol I - J.G.Olliver,
J.Clendinning

3) Surveying Vol I and II – Dr. Arora

Guidelines for setting Question Paper at S.E. Revised Syllabus (All Branches) to be effected from Academic year 2004-2005.

1. The syllabus for all subjects in this new curriculum is unitized into six units. Equal weight

age shall be given to all units with respect to number of questions and marks allotted as below:

2. Each paper shall consist of two sections - Section I and Section II

Units I through III shall be under section I and Units IV through VI shall be under Section II.

3. Every unit will carry two questions with internal choice / option offered as below:

01 OR 02.	Unit I	Marks: 16
03 OR 04	Unit II	Marks: 16
05 OR 02.	Unit III	Marks: 18

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