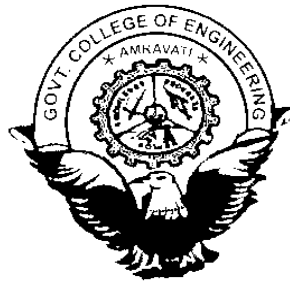


GOVT. COLLEGE OF ENGINEERING, AMRAVATI



B. TECH. (CIVIL) III and IV Semester CURRICULUM

**Department of Civil Engineering
2009-10**

Govt. College of Engineering, Amravati
Department of Civil Engineering
Third Semester

Corse Code	Name of the Course	Teaching Scheme				Evaluation System							Credits
		Theory Hrs/week	Tutorial Hrs/week	Practical Hrs/week	Total	Theory				Practical		Total	
						TA	CT1	CT2	ESE	Internal	External		
CE301	Mathematics-III	4	1	-	5	10	15	15	60	-	-	100	5
CE302	Strength of Materials	4	1	-	5	10	15	15	60	-	-	100	5
CE303	Engineering Geology	2	-	-	2	4	8	8	30	-	-	50	2
CE304	Construction Materials	2	-	-	2	4	8	8	30	-	-	50	2
CE305	Building Construction	4	-	-	4	10	15	15	60	-	-	100	4
CE306	Fluid Mechanics-I	3	1	-	4	10	15	15	60	-	-	100	4
CE307	General Profeciency-I	-	-	2	2	-	-	-	-	50	-	50	1
CE308	Strength of Materials-Lab	-	-	2	2	-	-	-	-	25	25	50	1
CE309	Engineering Geology - Lab	-	-	2	2	-	-	-	-	25	25	50	1
CE310	Building Construction -Lab	-	-	2	2	-	-	-	-	25	25	50	1
CE311	Fluid Mechanics-I-Lab	-	-	2	2	-	-	-	-	25	25	50	1
	Total	19	3	10	32							750	27

Note: The ESE duration for all courses shall be 2 hrs. 30 min. except courses CE303 and CE 304 for which the ESE duration will be 2 hrs.

Fourth Semester

Corse Code	Name of the Course	Teaching Scheme				Evaluation System							Credits
		Theory Hrs/week	Tutorial Hrs/week	Practical Hrs/week	Total	Theory				Practical		Total	
						TA	CT1	CT2	ESE	Internal	External		
CE401	Economics & Humanities	4	0	-	4	10	15	15	60	-	-	100	4
CE402	Water Resource Engg-I	3	1	-	4	10	15	15	60	-	-	100	4
CE403	Fluid Mechanics II	4	1	-	5	10	15	15	60	-	-	100	5
CE404	Concrete Technology	3	1	-	4	10	15	15	60	-	-	100	4
CE405	Surveying I	4	1	-	5	10	15	15	60	-	-	100	5
CE406	General Profeciency-II	-	-	2	2	-	-	-	-	50	-	50	1
CE407	Fluid Mechanics II-Lab	-	-	2	2	-	-	-	-	25	25	50	1
CE408	Concrete Technology-Lab	-	-	2	2	-	-	-	-	25	25	50	1
CE409	Surveying I-Lab	-	-	4	4	-	-	-	-	50	50	100	2
	Total	18	4	10	32							750	27

Note: The ESE duration for all courses shall be 2 hrs. 30 min.

Govt. College of Engineering, Amravati
Department of Civil Engineering

Fifth Semester

Corse Code	Name of the Course	Teaching Scheme				Evaluation System							Credits
		Theory Hrs/week	Tutorial Hrs/week	Practical Hrs/week	Total	Theory				Practical		Total	
						TA	CT1	CT2	ESE	Internal	External		
CE501	Theory of Structure I	4	1	-	5	10	15	15	60	-	-	100	5
CE502	Design of Reinforced Concrete Structures	3	1	-	4	10	15	15	60	-	-	100	4
CE503	Geotechnical Engineering -I	4	1	-	5	10	15	15	60	-	-	100	5
CE504	Surveying II	3	1	-	4	10	15	15	60	-	-	100	4
CE505	Building Design & Drawing	2	0	-	2	10	15	15	60	-	-	100	2
CE506	Computer Application in Civil Engineering-Lab	-	-	2	2	-	-	-	-	50	-	50	2
CE507	Design of Reinforced Concrete Structures-Lab	-	-	2	2	-	-	-	-	25	25	50	1
CE508	Geotechnical Engineering -I-Lab	-	-	2	2	-	-	-	-	25	25	50	1
CE509	Surveying II-Lab	-	-	2	2	-	-	-	-	25	25	50	1
CE510	Building Design & Drawing-Lab	-	-	4	4	-	-	-	-	25	25	50	2
	Total	16	4	12	32							750	27

Note: The ESE duration for all courses shall be 2 hrs. 30 min. except courses CE502 and CE505 for which the ESE duration will be 3 hrs.

Sixth Semester

Corse Code	Name of the Course	Teaching Scheme				Evaluation System							Credits
		Theory Hrs/week	Tutorial Hrs/week	Practical Hrs/week	Total	Theory				Practical		Total	
						TA	CT1	CT2	ESE	Internal	External		
CE601	Design of Steel Structures	3	1	-	4	10	15	15	60	-	-	100	4
CE602	Geotechnical Engineering -II	4	1	-	5	10	15	15	60	-	-	100	5
CE603	Environmental Engineering-I	4	0	-	4	10	15	15	60	-	-	100	4
CE604	Transportation Engineering-I	3	1	-	4	10	15	15	60	-	-	100	4
CE605	Estimating & Costing	3	1	-	4	10	15	15	60	-	-	100	4
CE606	Minor Project	-	-	2	2	-	-	-	-	25	25	50	2
CE607	Design of Steel Structures-Lab	-	-	2	2	-	-	-	-	25	25	50	1
CE608	Geotechnical Engineering -II-Lab	-	-	2	2	-	-	-	-	25	25	50	1
CE609	Transportation Engineering-I-Lab	-	-	2	2	-	-	-	-	25	25	50	1
CE610	Estimating & Costing-Lab	-	-	2	2	-	-	-	-	25	25	50	1
	Total	17	4	10	31							750	27

Note: The ESE duration for all courses shall be 2 hrs. 30 min. except courses CE601 and CE 605 for which the ESE duration will be 3 hrs.

Govt. College of Engineering, Amravati
Department of Civil Engineering

Seventh Semester

Corse Code	Name of the Course	Teaching Scheme				Evaluation System							Credits
						Theory				Practical		Total	
		Theory Hrs/week	Tutorial Hrs/week	Practical Hrs/week	Total	TA	CT1	CT2	ESE	Internal	External		
CE701	Elective -I	3	1	-	4	10	15	15	60	-	-	100	4
CE702	Theory of Structure -II	3	1	-	4	10	15	15	60	-	-	100	4
CE703	Construction Management	3	1	-	4	10	15	15	60	-	-	100	4
CE704	Water Resource Engg. -II	3	1	-	4	10	15	15	60	-	-	100	4
CE705	Environmental Engg-II	3	1	-	4	10	15	15	60	-	-	100	4
CE706	Project & Seminar	-	-	4	4	-	-	-	-	50	-	50	3
CE707	Elective -I-Lab	-	-	2	2	-	-	-	-	25	25	50	1
CE708	Theory of Structure -II-Lab	-	-	2	2	-	-	-	-	25	25	50	1
CE709	Water Resource Engg. -II-Lab	-	-	2	2	-	-	-	-	25	25	50	1
CE710	Environmental Engg-II-Lab	-	-	2	2	-	-	-	-	25	25	50	1
	Total	15	5	12	32							750	27

Note: The ESE duration for all courses shall be 2 hrs. 30 min. except course CE702 for which the ESE duration will be 3 hrs.

Eighth Semester

Corse Code	Name of the Course	Teaching Scheme				Evaluation System							Credits
						Theory				Practical		Total	
		Theory Hrs/week	Tutorial Hrs/week	Practical Hrs/week	Total	TA	CT1	CT2	ESE	Internal	External		
CE801	Elective -II	3	1	-	4	10	15	15	60	-	-	100	4
CE802	Elective -III	3	1	-	4	10	15	15	60	-	-	100	4
CE803	Advance Structural Design	3	1	-	4	10	15	15	60	-	-	100	4
CE804	Transportation Engg-II	3	-	-	3	10	15	15	60	-	-	100	3
CE805	Project & Seminar	-	-	4	4	-	-	-	-	100	100	200	9
CE806	Elective -II-Lab	-	-	2	2	-	-	-	-	25	25	50	1
CE807	Elective -III-Lab	-	-	2	2	-	-	-	-	25	25	50	1
CE808	Advance Structural Design-Lab	-	-	2	2	-	-	-	-	25	25	50	1
	Total	12	3	10	25							750	27

Note: The ESE duration for all courses shall be 2 hrs. 30 min. except course CE 803 for which the ESE duration will be 3 hrs.

Govt. College of Engineering, Amravati
Department of Civil Engineering

Sr. no.	Elective I	Sr. no.	Elective II	Sr. no.	Elective III
1	Structural Dynamics	1	Earthquake Resistant Design	1	Adv. Hydraulic Structures
2	Advance Geotechnical Engineering	2	Adv. Structural Analysis	2	Adv. Design of Steel Structure
3	Matrix Analysis of Structures	3	Pavement Design & Construction	3	Finite Element Methods
4	Water Treatment Process & Technology	4	Adv. Waste Water Treatment	4	Ground Improvement Technology
5	Traffic Engineering & Control	5	Adv. Foundation Engineering	5	GIS & Remote Sensing
6	Advance Hydraulics	6	Adv. Construction Management	6	Environmental Pollution & Soild Waste Management

CE301 - MATHEMATICS-III

Teaching Scheme : 04 L + 01 T Total = 05

Credits: 05

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE

Total Marks: 100

Duration of ESE: 2hrs.30 min.

Linear Differential Equations with constant coefficients:

General solution to L.D.E. of n^{th} order with constant coefficients, rules for finding C.F., General method for finding P.I., P.I. of some standard functions, Method of Variation of Parameters, Cauchy's and Legendre's L.D.E.

Applications of L.D.E. to deflection of beam, bending moments, shear force, vibrations of Springs, Projectile motion.

Partial Diff. Equations:

Definition, formation of P.D.E., complete solution of PDE, Linear and non-linear PDE of types (i) $f(p, q) = 0$, (ii) $f(p, q, z) = 0$, (iii) $f(p, q, x, y) = 0$, (iv) $f(p, q, x, y, z) = 0$ ie Lagrange's form $Pp + Qq = R$ and Clairaut's form $z = px + qy + f(p, q)$, (v) Equations reducible to above forms. Complete solution of PDE of first and second order by method of separation of variables.

Laplace Transform:

Definition, standard formulae and properties of LT., Laplace Transform of unit step and periodic functions. Laplace Transform of unit impulse function, Inverse Laplace Transform, Convolution Property, Application of LT to solve LDE with constant coefficients.

Numerical Methods:

- a) Solution of system of linear equations by Crout's method, Gauss Siedal method.
- b) Numerical solution of ordinary differential equations: Picard's method, Taylor's series method, Modified Euler's method, Runge Kutta method.

Statistics :

Correlation : coefficient of Correlation, lines of regression, Curve fitting by least square method. Probability distribution Binomial, Poisson & Normal

Text Books:

1. A Text Book of Applied Mathematics Vol. I and Vol. II, Wartikar P. N. and Wartikar J. N. , Pune Vidyarthi Griha Prakashan ,Pune.
2. Higher Engineering Mathematics, Grewal B., S., Khanna Publication, 2001

Reference Books:

1. Advance Engineering Mathematics, Erwin Kreyzig, 9th Edition, John Wiley Publication
2. Advanced Engineering Mathematics, Wylie C.R., McGraw Hill Publications, New Delhi.
3. Advanced Engineering Mathematics, Peter V.O'Neil, 5th Edition, Thomson Brook/cole, Singapore.
4. Advanced Engineering Mathematics, John bird, 5th edition, Elsevier publication.

CE302-STRENGTH OF MATERIALS

Teaching Scheme : 04 L + 01 T Total = 05

Credits: 05

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE

Total Marks: 100

Duration of ESE: 2hrs.30 min.

Mechanical properties: Concept of direct, bearing and shear stresses and strains, stress-strain relations, Biaxial and triaxial loading, elastic constants and their relationship, stress-strain diagrams and their characteristics for mild steel, tool steel and concrete, Generalized Hooke's law, factor of safety.

Uniaxial stresses and strains: Stresses and strains in compound bars in uniaxial tension and compression, temperature stresses in simple restrained bars and compound bars of two metals only.

Axial force, shear force & bending moment diagrams: Beams, loading and support conditions, bending moment, shear force and axial load diagrams for all types of loadings for simply supported beams, cantilevers and beams with overhangs, relation between shear forces, bending moment and loading intensity.

Stresses in beams (Bending, Shear):

i) Bending: Theory of simple bending, section modulus, moment of resistance, bending stresses in solid, hollow and built up section.

ii) Shear: Distribution of shear stresses on beam cross sections,

iii) Strain energy under uniaxial tension and compression, impact loads and instantaneous stresses.

Torsion: Theory of torsion & assumptions, derivation of torsion equation, polar modulus, stresses in solid & hollow circular shaft, power transmitted by shaft, closed coiled helical spring with axial load.

Thin cylinders: Thin cylinders subjected to internal pressures.

Theories of elastic failure: Introduction to theories of elastic failure

Principal stresses: Biaxial stress system, principal stresses, principal planes, Mohr's circle of stresses, principal strains.

Combined direct & bending stresses: Combined direct and bending stresses, applications to short columns with eccentric loads, retaining walls with horizontal lateral force.

Slope & deflection of beams: Slope & deflection in statically determinate beams subjected to point loads, uniformly distributed loads, moments by a) Macaulay's method b) Moment Area method c) Conjugate Beam method.

Columns: Theory of long columns, Euler, Rankine and Secant formula

Text Books:

1. Engineering Mechanics of Solids, E.P. Popov, 2nd Edition, Prentice Hall of India, 1998
2. Mechanics of Materials, Beer, Johnston and DeWolf, 3rd Edition, Tata McGraw Hill Publication, New Delhi, 2002.

Reference Books:

1. Mechanics of Materials, Gere and Timoshenko, 2nd Edition, CBS publishers, 2002

2. Mechanics of Solids in Introduction, Laudner T.J. and Archer R.R., McGrawHill International Editions, 1994.
3. Theory and Problems of Strength of Materials, William A. Nash, 3rd Edition, Schaum's Outline Series, McGraw Hill International Editions, 1994.

CE303 – ENGINEERING GEOLOGY

Teaching Scheme : 02 L + 00 T Total = 02

Credits: 02

Evaluation Scheme: 08 CT1 + 08 CT2 + 04 TA + 30 ESE

Total Marks: 50

Duration of ESE: 2hrs.

Different branches of Geology and importance of geology in Civil Engineering.

Mineralogy: - Study of common rock forming and ore minerals, with reference to its physical properties.

Petrology: - Rock cycle, rock weathering and soil formation, origin, classification and textures of igneous sedimentary and metamorphic rocks, study of common rock types.

Structural Geology: - Outcrop; dip strike, elementary ideas about folds, joints and unconformity, effect of these structures in foundation.

Earthquakes Engineering: - Earthquake waves, causes and effects, magnitudes and intensity, earthquake zones of India, seismic coefficient.

Geological Investigation: - Surface and sub-surface investigation, direct and indirect.

Rock: Rock as a material of construction. Study of engineering properties of rocks and soils. Geological studies related to site selection for dam and reservoirs, tunnel alignment, hydroelectric plants, bridges, roads, air fields, etc. case histories of some major projects of tunnels, dams and reservoirs.

Text Books:

1. General & Engineering Geology, Parbin Singh, 6th Edition, Kataria S. K. Sons, 2001.
2. Engineering Geology, Goodman, R.E., John Wiley and Sons, NY, 1993.

Reference Books:

1. Geology of India, Wadia D.N., 4th ed. Tata McGraw Hill, , New Delhi, 1978
2. Geology of India, Krishan M.S., 5th ed., CBS Publishers,, New Delhi, 1982.
3. Geology for Engineers, Blyth, F.G.H. and de Freitas, M.H., ELBS, 1994.
4. Geology for Civil Engineers, McLean, A.C. and Gribble, C.D., 3rd Edition, Unwin Hyman, London, 1988.

CE304 - CONSTRUCTION MATERIALS

Teaching Scheme : 02 L + 01 T Total = 03

Credits: 02

Evaluation Scheme: 08 CT1 + 08 CT2 + 04 TA + 30 ESE

Total Marks: 50

Duration of ESE: 2hrs.

Building stones: Qualities of good building stones, Common building stones, their properties and uses, Dressing of stone, Selection of stone for different Civil works

Bricks: Manufacture of bricks, Qualities of good bricks, Field and laboratory tests on bricks, Classification of bricks.

Concrete blocks: Types-solid and hollow, common dimensions, manufacture of blocks, uses

Lime: Classification of lime and their uses in construction works, Slaking of lime-different methods,

Mortars: Ingredients and their functions, Types of mortars and their suitability, Preparation of mortar, Proportion of mortars used for different works

Timber and wood based products: Structure of timber, Characteristics of good timber, Chief varieties of timber and their uses in construction, Market forms of timber and their uses in construction, Industrial timber products-veneer, veneer ply wood, particle board, fiber board, batten board, block board, lamin board, laminates, advantages and uses of processed timber

Fixtures and fastenings of doors and windows: Hinges-types and uses, Bolts-types and uses, Handles and locks, Nails and screws

Glass: Constituents, Properties, Types of glasses, their characteristics, market forms, uses in construction.

Metals & alloys:

Mild steel: Constituents, properties, Market forms of mild steel-round bars, flats, plates, pipes, Indian standard rolled steel sections, uses

Aluminum: Properties, advantages, market forms, uses, anodizing of aluminum

Cast iron: Constituents, properties, uses

Copper: Properties and uses, alloys of copper and their uses

Composite panels- uses

Gypsum and allied product: composition, properties and uses, Market forms-plaster boards, blocks and tiles, Plaster of Paris

Plastic: Classification, properties, uses, market forms, P.V.C. floor tiles, laminated plastic, plastic sheets, plastic panels, P.V.C. pipes, P.V.C. roofing sheets, Fiber reinforced plastic sheets.

Ceramic products: Ceramic sanitary appliances-water closets, urinals, traps, wash basins, sinks, their common sizes, stone ware pipes & fittings, Glazed ceramic tiles

Flooring tiles: Types-plain cement tiles, Mosaic tiles, chequered tiles, ceramic tiles, glazed tiles, P.V.C. flooring tiles, manufacture of mosaic flooring tiles

Paints Enamels and varnishes: Types, Composition, characteristics and uses, covering power of paint

Miscellaneous materials

Asbestos: Properties and uses, A.C. roofing sheets-types and dimensions, A.C pipes

Insulating materials: Sound & heat insulating materials, Common forms -their properties and uses

Adhesives

Water proofing compounds- suitability and uses

Termite proofing chemicals

Text Books:

1. Building Materials , P.C. Verghese, Prentice-Hall of India, New Delhi
2. Civil Engineering Materials, T.T.T.I. Chandigarh , Tata Mc-Graw Hill Publishing Co., New Delhi

Reference Books:

1. A Text Book of Building Materials, Amargit Aggarwal and N.L. Arora, New India Publishing House, New Delhi
2. Civil Engineering Materials, Duggal A. K., TMH Publication.
3. Building Construction, Mckey, Volumes 1-8
4. Building Materials Technology, Brantly, Tata McGraw Publication

CE305 - BUILDING CONSTRUCTION

Teaching Scheme : 04 L + 00 T Total = 04

Credits: 04

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE

Total Marks: 100

Duration of ESE: 2hrs.30 min.

BUILDING COMPONENTS

Introduction: Building-definition as per IS, Types of building as per National Building Code, Components of buildings and their functions, Types of structures-load bearing, framed and composite structures, their suitability, relative advantages and disadvantages

Foundation: Definition, purpose, Loads acting on foundation, Safe bearing capacity of soil-definition, values from IS code, Methods of improving bearing capacity of soil, Types of foundation-shallow foundation & deep foundations for buildings- spread footings for walls and columns, combined footing for columns, raft foundation, Black cotton soil-characteristics, problems in construction, precautions to be taken, Foundations in black cotton soil-under reamed pile foundations, Failure of foundation- causes, Setting out for foundation

Beams and Column: Types and positioning

Floors & Floor finishes: Floors- Definition & purpose, Types of R.C.C. floors, their suitability and construction procedure, Types of flooring-suitability and construction procedure

Doors & Windows: Doors-Purpose, Criteria for location, Sizes, Types of door frames, Methods of fixing door frames, Types of door shutters-ledged-braced & battened, fully

paneled, flush, louvered, glazed, Other types of doors and their suitability-sliding, revolving, rolling shutter, collapsible door, grilled door

Windows-Purpose, Criteria for location, Sizes, Types of wooden windows-casement, louvered, glazed, Metal windows, Aluminum windows, Corner & bay windows, Ventilators-purpose and types, Grills for windows

Lintels and Arches: Lintels-purpose, types and their suitability, details of R.C.C. lintel, Arches- types

Stairs: Function, Technical terms, Criteria for location, Requirements of good stair, Types of stairs and their suitability, Principle of stair design, Lifts, Ramps, Escalators

Roofs: Flat & pitched roofs-suitability, Types of steel roof trusses and their suitability, Placing and fixing trusses, Types of roofing sheets, Fixing of roofing sheets to trusses

CONSTRUCTION PROCESSES

Masonry construction:

Stone masonry: Materials required, Technical terms, Principles to be observed during construction, Commonly used types and their suitability, Construction procedure

Brick Masonry: Materials required, Technical terms, Principles to be observed during construction, Commonly used bond and their suitability, Construction procedure, defects in brick masonry, Strength of brick masonry

Reinforced Brick masonry: Applications, Advantages, Materials required, Construction procedure

Concrete block masonry: Materials required, Construction procedure

Composite masonry: Types, advantages, applications, Materials required, Construction procedure

Plastering and pointing: Purpose, Types and their suitability, Procedure of plastering and pointing, Defects in plastering work

Coloring & painting: Procedure of painting old and new masonry surfaces, metal surfaces and wooden surfaces

Damp proofing: Causes and effects, Methods of damp proofing, materials required, Details of cavity wall construction

Sound proofing: Factors affecting acoustical design of an auditorium, Various methods, Materials required

Fire proofing: Points to be observed during planning and construction, Fire protection requirements of a multistoried building, fire escape elements, fire proofing of building elements

Termite proofing: Methods, procedure

Joints in structure: Construction joints-necessity, provision of construction joint in slab, beam and columns, Expansion joints –necessity, location, materials used, details of expansion joints and foundation and roof level for a load bearing and framed structure

Formwork & scaffolding: Form work-types and suitability, Period for removal of formwork, Scaffolding: Necessity, Types, Details of erections

Text Books:

1. Fundamentals of Building Construction, Materials and Methods, Allen Edward and Lano Joseph, 4th Edition, John Wiley Publication.
2. A Text Book of Building Construction, Sharma and Kaul, Schaum Series, TMH

Reference Books:

1. National Building Code of India 2005, B.I.S , Techniz Books International, New Delhi.
2. Building Materials & Components, C.B.R.I., (2005), Tata Mc-Graw Hill Publishing Co. New Delhi

CE306 - FLUID MECHANICS – I**Teaching Scheme : 03L + 01 T Total = 04****Credits: 04****Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE****Total Marks: 100****Duration of ESE: 2hrs.30 min.**

Introduction: Fluid & Fluid Mechanics, Applications in Civil Engineering, Physical properties of fluids-mass density, unit weight, specific gravity, compressibility, bulk modulus, capillarity, surface tension, viscosity, Newton's law of viscosity, Dynamic and kinematics viscosity, classification of fluids

Fluid Statics: Hydrostatic law, pressure at a point, Pascal's law, Pressure head, Atmospheric pressure, Absolute and gauge pressure, total pressure and center of pressure, Pressure diagram, Determination of Total pressure on plane and curves surfaces of water tanks, earthen and gravity dams, spillways, spillway gates, sluice gates, sluice valves.

Buoyancy and Floatation: Buoyant force and center of buoyancy, Archimedes Principle, Principle of floatation, Metacenter and metacentric height, Equilibrium of floating bodies,

Fluid kinematics: Types of flow-steady & unsteady, uniform & non-uniform, laminar & turbulent, one, two & three dimensional, rotational & irrotational, compressible and incompressible, Reynold's experiment and Reynolds number, Euler's approach of describing fluid motion- Velocity and acceleration, Stream line, Streak line, Path line, Stream tube, Stream function, Velocity potential, Flow net- uses, limitations & methods of drawing, Discharge, Continuity equation of fluid flow

Fluid Dynamics: Euler's equation of motion, Bernoulli's equation, assumption and limitations, kinetic energy correction factor, different forms of energy heads, loss of head, Modified form of Bernoulli's theorem, Energy gradient line and Hydraulic gradient line, Impulse momentum equation, momentum correction factor.

Flow through pipes: Characteristics of turbulent flow through pipes, Velocity distribution in turbulent flow, Major losses and minor losses, Darcy Weisbach equation, Factor affecting friction factor, Coefficient of friction for commercial pipes, roughening of pipes with age, Moody's diagram, Flow through simple pipes, pipes in series, pipes in parallel, siphons pipes, Equivalent pipes, Water hammer in pipes-causes, effects & remedial measures, Transmission of power through pipe flow

Uniform Flow through channel: Types of channels, Geometrical properties of prismatic channel section, types of flow through channel, Characteristics of uniform flow through prismatic channel, Chezy's equation, Mannings equation, Mannings constant for different types of channel surfaces, Economical channel section, Conditions for rectangular & trapezoidal economical channel section, Specific energy of flow, Specific force and

specific discharge, specific energy diagram, critical depth, criteria for critical depth, subcritical, critical and supercritical flow, Froude No.

Flow measurements:

Velocity measurements: Pitot tube- basic principle of working, types, measurement of velocity of flow in pipes and channel, Current meter-types and working, Floats-types

Discharge measurement for pipes: Venturimeter-principle, equation for discharge, orifice plate meter

Discharge measurement for channels: Notches-Types, Discharge over rectangular notch, triangular notch, trapezoidal notch, Cippolletti notch, End contraction and velocity of approach, Francis formula, Weirs- discharge over broad crested weir, Flumes- Venturiflume and Parshall flume-working principle and computation of discharge, River gauging by segment method

Discharge measurement for tanks: Orifice-types, flow through circular sharp crested orifice, hydraulic coefficient, time required to empty tank by orifice, Mouthpiece-types, flow through external cylindrical mouthpiece (submerged & free)

Text Books:

1. Theory & Applications of Fluid Mechanics, Subramanya K., Tata McGraw Hill, 1st Edition , 2001
2. Fluid Mechanics, V.L. Streeter E.B. and Wylie, 9th edition, McGraw Hill Book Co., 1998.

Reference Books:

1. Flow in Open Channels, K.G. Rangaraju, Tata McGraw Hill Publication Co. Ltd., New Delhi, 1993.
2. Principles of Fluid Mechanics, Alexandrou, 1st Edition , Prentice Hall, 2001
3. Fluid Mechanics; with Engineering Application, R.L. Daugherty, J.B. Franzini, E.J. Finnermore, McGraw Hill International Edition, 1989.
4. Essentials of Fluid Mechanics, John M. Cimbala & Yunus A. Cengel, 1st Edition, McGraw Hill, 2008.

CE307 GENERAL PROFECIENCY I

Teaching Scheme: 02 P Total = 02
Evaluation Scheme: Internal = 50

Credit : 1
Total Marks: 50

Word study: synonym, antonym, meanings, matching words, adjectives, adverbs, prefix, correct forms of commonly misspelled words, understanding of the given passage.

Comprehension overran unseen passage,

Most commonly spoken sentences: Introduction to Neuro Linguistic Programming. Verbal communication, its significance, types of written communication, organization of a text. (Titles summaries, headings, sequencing, signaling, cueing etc.), important text

factors (length of paragraph, sentences, words, clarification and text it selectivity and subject content.

Non verbal communication, types of graphics and pictorial devises, body language.

Text Books:

1. Communication skill by Leena Sen, Printice Hall of India, 2000
2. Basic Communication Skills for Technology, Rutherford, 2/e Pearson Education India , 2001

Reference Books:

1. Communicate to Win, Kogan Page , 2006
2. Communication at Work: Principles and Practices for Business and the Professions, Adler, Ronaold B, 6th Edition., McGraw Hill, 1999
3. Communication Skill, John Bench, John Wiley & Sons, 1992
4. Effective communication for Professionals and Executives, Bowbrick, P., Graham & Trotman, 1988

CE308-STRENGTH OF MATERIALS-LAB

Teaching Scheme: 02 P Total = 02

Credit : 1

Evaluation Scheme: Internal = 25; External = 25

Total Marks: 50

The Lab consists of 8 experiments from part A, while part B is compulsory

List of Experiments:

Part A-

1. Tension test on mild steel
2. Test on tor steel (tension, bend and rebend)
3. Compression test on metals
4. Compression test on Wood
5. Shear test on metals.
6. Impact test on metals
7. Hardness test on metals
8. Torsion test on metals
9. Deflection of beams.
10. Modulus of rupture test.
11. Buckling of columns
12. Deflection of springs.

Part B: At least four problems from four different units of syllabus to be solved using either programming or spreadsheet or solvers or any software.

CE309 – ENGINEERING GEOLOGY – LAB

Teaching Scheme: 02 P Total = 02
Evaluation Scheme: Internal = 25; External = 25

Credit : 1
Total Marks: 50

List of Experiments

1. Megascopic study of common rock forming and ore minerals.
2. Megascopic study of the common igneous, sedimentary and metamorphic rocks.
3. Geological map reading and construction of sections from simple geological
4. Maps with engineering problems (about 8 maps)

A Lab Report based on above practical shall be submitted by each student.
Practical examination shall be based on practical and viva voce conducted on the above syllabus.

CE310- BUILDING CONSTRUCTION – LAB

Teaching Scheme: 02 P Total = 02
Evaluation Scheme: Internal = 25; External = 25

Credit : 1
Total Marks: 50

List of Experiments

1. Sketch book containing following free-hand sketches
 - i) Different types of foundations
 - ii) Different types of R.C.C. Floors
 - iii) Line diagrams of different types of steel roof trusses
 - iv) Different types of stairs (plan and elevations)
 - v) Types of stone masonry (elevations)
 - vi) Types of bonds in brick masonry –plan and elevation of stretcher & header bond, 1 brick thick wall in English and Flemish bond, brick columns
 - vii) Expansion joints at foundation and roof level in load bearing and framed structure
 - viii) Any one type of scaffolding (elevation and section)
 - ix) Form work for R.C.C. floor
 - x) Section of typical load bearing and framed structure
2. Drawing of following building components on half imperial drawing sheet
 - i) Details of fully paneled/flush door and glazed window, indicating dimensions
 - ii) Design of layout of R.C.C. dog-legged stair and its drawing (plan and section)

- iii) Details of steel roof truss along with roof covering and fixing at support
 - iv) Preparation of setting-out plan for foundation from given line plan of a two-room building
3. Setting out in field for foundation of building from the plan in sheet no. 4

Practical Examination;

Practical examination shall consist of oral examination based on Lab Report.

CE311 - FLUID MECHANICS –I-LAB

Teaching Scheme: 02 P Total = 02

Credit : 1

Evaluation Scheme: Internal = 25; External = 25

Total Marks: 50

List of Experiments

1. Reynolds experiment-study of laminar and turbulent flow, determination of Reynolds No.
2. Study of floating bodies-determination of metacentric height, type of equilibrium
3. Study of Bernoulli's theorem-drawing EGL & HGL, determination of losses
4. Calibration of Venturimeter /Orifice plate meter
5. Determination of hydraulic coefficients of orifice/mouthpiece
6. Determination of friction factor/coefficient of friction for pipes of different diameter/materials
7. Determination of minor losses in pipes fittings (Elbow / bends / valves / reducers / taper)
8. Calibration of rectangular/triangular notch
9. Study of uniform flow through prismatic channel-determination of Chezy's / Manning's constant

Lab Report:

Lab Report shall consist of the detailed report on experiments conducted and studied.

Practical Examination:

Practical examination shall consist of oral examination based on Lab Report

CE401 - ECONOMICS AND HUMANITIES

Teaching Scheme : 04 L + 00 T Total = 04

Credits: 04

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE

Total Marks: 100

Duration of ESE: 2hrs.30 min.

ECONOMICS:-

Nature and Scope of Economics: Special significance of economics to engineers

Production: Factors of Production, Laws of return, Various Economics system, Forms of Business organization.

Banking: Function of Central and Commercial Banks

Taxation: Principal of taxation, Direct and Indirect taxes

Market: Forms, perfect and imperfect competition, pricing under perfect and imperfect competition, prices discrimination under monopoly

Economics of Development: Meaning, Characteristics of under development, obstacles to economic growth and vicious circle of poverty

Economic planning: Meaning, objective and salient features of current five years plan of India

Planning horizons, life structuring the alternatives

Economics of comparison of different alternative projects.

HUMANITIES:

Salient features of Indian Constitution, Fundamental rights and Duties, Directive Principles of State Policy

Indian parliament: Composition and powers, President of India, election and powers, Council of Ministry and Prime Ministers

Impact of science and Technology on Culture and Civilization.

Human Society: Community Groups, Social Control: Meaning, Types and Agencies, marriage and Family: Functions, Types and Problems.

Text Books:

1. Human Society, Davis K, McMillan Co., New York, 1961.
2. Elementary Economic Theory, Dewett and Varma J. D, Publisher S. Chand & Co, New Delhi
3. Constitutional Govt. in India, Pylee M. V, S. Chand & co, New Delhi.

Reference Books:

1. The Constitution of India, Joshi G. N., MacMillan India Ltd.
2. Principles of Sociology, Maclaver and Page.
3. Economics: An Introduction to its Basic Principles, Mitra, J. K., Word Press Pvt. Ltd.
4. Engineering Economics, Reggs J.L., McGraw Hill Co., 1976.

CE402 - WATER RESOURCES ENGINEERING – 1

Teaching Scheme : 03 L + 01 T Total = 04

Credits: 04

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE

Total Marks: 100

Duration of ESE: 2hrs.30 min.

ENGINEERING HYDROLOGY:-

Definition and its importance, hydrological cycle, Hydrologic equation.

Precipitation :- Forms, Types , factor affecting, measurement, rain gauge network, estimation of missing data, consistency of data, mean area precipitation, brief introduction of intensity- duration-Frequency relationship and artificial rain.

Evaporation: - Process, factor affecting, measurement and estimation, control of evaporation.

Evapo-transpiration- factor affecting, measurement and estimation

Infiltration: - Process, factor affecting, measurement, infiltration indices,

Run off: - Factor affecting, estimation of runoff, rainfall- runoff correlation

Flood:- Flood classification, importance, estimation of flood, flood control techniques, brief description of flood. Routing. Channel flow routing.

Hydrographs- Typical flood control hydrograph, base flow separation, depression storage, overland flow, unit hydrograph, s-curve hydrograph. Synthetic unit hydrograph.

IRRIGATION ENGINEERING:-

Irrigation: Necessity, advantages & disadvantages of irrigation, suitability of soil, standards of irrigation water.

Minor Irrigation works: - Necessity and general layout of Bandhara and percolation tank

Lift Irrigation: - Necessity and general layout, main components.

Crop Water Requirements: - Principal Indian crop seasons and their CWR, Duty and Delta, Consumptive used of water, irrigation methods and their efficiencies. Comparative study of different irrigation methods, sprinkler and drip irrigation methods

Ground Water: - Ground and surface water resources, aquifer parameters, specific yield and specific capacity, Well hydraulics for steady flow condition, safe yield and yield tests.

Water Logging: - causes, control, preventive and curative measures, reclamation of alkaline and saline lands, drainage system design.

Water Harvesting:- Definition, Necessity, water harvesting potentiality, elements of typical water harvesting system, methods of water harvesting and cost of water harvesting.

Text Books:

1. Water Resources Systems Planning and Management, Chaturvedi M. C., Tata McGraw Hill,1987
2. Irrigation, Zimmerman J.D, John Wiley and Sons., New York, 1966

Reference Books:

1. Hydrology, Subramanyam K, 2nd Edition, Tata McGraw Hill, 2003.

2. Hydrology: Water Quantity and Quality Control, Todd David Keith , Mays Larry W., 2nd Edition, John Wiley and Sons., New York, 2004.
3. Handbook of Hydrology, Chow, Y. T., McGraw Hill, 1988
4. Ground Water by Raghunath H. M., 2nd edition, Wiley Eastern Ltd. New Delhi, 1983.

CE403- FLUID MECHANICS –II

Teaching Scheme : 04 L + 01 T Total = 05

Credits: 05

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE

Total Marks: 100

Duration of ESE: 2hrs.30 min.

Flow around immersed objects: Practical problems involving flow around immersed objects, Drag and lift-definition & expression, Types of drag, Pressure drag on flat plate, cylinder and sphere, Stream line & bluff bodies

Laminar flow: Relation between shear stress and pressure gradient, Steady laminar flow through circular pipes, Hagen-Poiseuille law (no derivation), Laminar flow between parallel plates, Laminar flow through porous media

Boundary layer theory: Definition, Thickness of boundary layer, Nominal, momentum, displacement and energy thickness, Factors affecting boundary layer, Development of boundary layer along long thin plate, Laminar, turbulent and transitional boundary layer, laminar sub-layer, Boundary layer on rough surface, Total drag due to laminar & turbulent boundary layer, Hydrodynamic ally smooth and rough boundaries, Separation of boundary layer and its control.

Non-uniform flow through channel: Types of non-uniform flow, Gradually varied flow (GVF) and rapidly varied flow (RVF), Equation of GVF and its alternative solutions, Classification of channel bed slopes, Various GVF profiles, their characteristics and field examples, Rapidly varied flow, Hydraulic jump- definition, location, practical examples of its occurrence, Analysis of hydraulic jump in rectangular channel-relation between conjugate depths, energy dissipation, Classification of jumps, Practical applications of hydraulic jump

Model investigations: Dimensions of physical quantities, Dimensional homogeneity, Buckingham's π theorem for dimensional analysis, Uses and limitations of dimensional analysis, Model study-similitude, Types of similarities, Types of forces acting on structures, Force ratios, Non-dimensional numbers and their significance, Model laws and their applications for model studies of hydraulic structures, Distorted and undistorted models, Scale effects

Impact of jet - Impact of jet on plane and curved surfaces (stationary and moving), Moment of momentum equation, Force exerted by jet on symmetrical and unsymmetrical moving curved vanes when jet striking tangentially at the tip, Force exerted by jet on series of vanes and radial curved vanes

Pumps: Definition and types and suitability,

Centrifugal pump: Components and their functions, principle, working, priming, efficiency and power required, net positive suction head, limit of suction head, Multistage pumps, pumps in series, Installation and operation of pumps

Reciprocating pumps: Components and their functions, principle, working, efficiency and power required, Air vessels, indicator diagrams

Modern Pumps: Deep submersible pumps- Components and working, Jet pumps, turbine pumps

Hydraulic turbines: Elements of hydroelectric power generation power plant, Surge tank-function, location and classification, Hydraulic turbines-definition, Heads and efficiencies, Classification based on various criteria, Choice of turbine, Specific speed and its significance, Unit speed, unit power, Unit discharge Pelton wheel turbine and Francis turbine – suitability, components and their functions, work done, power and efficiency

Text Books:

1. Hydraulics and Fluid Mechanics, Modi and S.M. Seth, Standard Book House, New Delhi.
2. Fluid Mechanics, White F. M., 5th Edition, McGraw Hill International Publication, 2003.

Reference Books:

1. Fluid Mechanics, V.L. Streeter E.B. and Wylie, McGraw Hill Book Co., 1983.
2. Fluid Mechanics with Engineering Application, R.L. Daugherty, J.B. Franzini, E.J. Finnemore, McGraw Hill, International Edition, 1989.
3. Fluid Mechanics with Engineering Applications, E. John Finnemore and Joseph B. Franzini, 10th Edition , McGraw Hill, 2002
4. Essentials of Fluid Mechanics, John M. Cimbala and Yunus A. Cengel, 1st Edition, McGraw Hill, 2008

CE404 - CONCRETE TECHNOLOGY

Teaching Scheme : 03 L + 01 T Total = 04

Credits: 04

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE

Total Marks: 100

Duration of ESE: 2hrs.30 min.

Ingredients of Concrete:

Cement: Various types of cement, Chemical Composition of Portland Cement, Manufacture of Portland Cement, Properties of Cement, Laboratory Tests.

Aggregate: Classification of Aggregate, Physical Properties, Bulking and Moisture Content, Specific Gravity, Bulk Density, Laboratory Tests

Water: Impurities in Water and Their Effects on Properties of Concrete.

Admixtures: Various Types of Admixtures and Their Functions.

Proportioning of Concrete Mixes: Introduction of Mix Design, Basic Consideration in Concrete Mix Design, Factors Influencing the Choice of Mix Proportions, Methods of Concrete Mix Design with special emphasis on IS Code Method And IRC-44 Method.

Production of Concrete: Batching of Materials, Mixing, Transportation and Placing of Concrete, Compaction of Concrete, Curing of Concrete.

Properties of Fresh Concrete: Workability of Concrete, Factor Affecting Workability, Measurement of Workability.

Properties of Hardened Concrete: Strength of Concrete, Stress-Strain Characteristics, Shrinkage and Temperature Effect, Creep, Permeability and Durability of Concrete.
 Inspection, Testing And Quality Control of Concrete: Inspection, Testing of fresh Concrete, Factors causing Variation in Quality of Concrete, Field Control, Advantages of Quality Control, Testing of Hardened Concrete (NDT Methods).
 Special Concretes and Concreting Techniques: Light Weight Concrete, Fiber-Reinforced Concrete, Roller Compacted Concrete, High Strength Concrete, Vacuum Concrete, Ferro Cement.
 Guniting, Grouting and Shotcreting Concrete.
 Repair For Concrete Structures: Repair of Cracks, Repair and Strengthening of Columns, Beams And Slab, Leak Sealing.

Text Books:

1. Concrete Technology, Neville A. M. and Brooks J. J., Pearson, 1987
2. Concrete Technology, Gambhir M L, 3rd Edition, Tata McGraw Hill, New Delhi, 2003

Reference Books:

1. Lea’s Chemistry of Cement and Concrete, Lea F M, Edward, Elsevier, 2003.
2. Properties of Concrete, Neville A M, 4th Edition, Pearson, 1995.
3. Concrete, Mindess Sidney, Young J. Francis and Darwin David, 2nd Edition, Prentice Hall, 2002.
4. Design of Concrete Mixes, Krishna Raju, 4th Edition, CBS Publishers, 2000.

CE405 - SURVEYING-I

Teaching Scheme : 04 L + 01 T Total = 05

Credits: 05

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE

Total Marks: 100

Duration of ESE: 2hrs.30 min.

Introduction: Surveying- Necessity & purpose, Classification of survey, principles of surveying, Basic measurements in surveying, work of surveyor

Linear Measurements and offsets: Instruments for measurement of distance, linear measurements, errors in measurements, corrections to field measurements, Instruments for marking stations, ranging out, direct and indirect ranging, Chaining on sloping ground, offsets for locating details, degree of accuracy of offsets, Instruments for setting right angle, obstacles in chaining & ranging, Cross staff survey

Chain & Compass surveying : Selection of survey stations, Survey lines, Bearing of a line, fore bearing, back bearing & reduced bearing, Prismatic compass 7 Surveyors compass – its use & adjustment, local attraction, magnetic declination & its variation, calculation of included angles from bearing

Chain & compass traversing- Open & closed traverse, reconnaissance, fixing of stations, Booking field notes, Plotting of traverse survey, adjustment of traverse by Bowditch’s graphical method,

Plane table surveying: Introduction, use, advantages & disadvantages, accessories required, principle of plane table surveying, orientation of plane table, methods of orientation, methods of plane table surveying, two point & three point problems.

Leveling : Technical terms, principle of leveling, Bench mark & its types, Instruments used for leveling, dumpy level, tilting level, automatic level, Digital level, Temporary & permanent adjustments, leveling staffs and its types, precautions in leveling, booking of field readings in field book, calculation of RL by using height of collimation method & rise & fall method. Arithmetic check, Classification of leveling-reciprocal, leveling difficulties, Errors and mistakes in leveling, correction for curvature & refraction, Transfer of data from digital level to PC software.

Profile Leveling: Fixing alignment, L-section & Cross section, selection of scales & plotting, fixing formation level

Contouring: Definition, characteristics, contour interval, methods of locating contours, interpolation of contours, contour maps & its uses, counter drawing

Computation of Area & volume: Planimeter- theory, zero circle, digital planimeter, computation of area, Computation of Volume by mean area method, trapezoidal rule, prizmoidal formula, volume of earth work from contour plan, capacity of a reservoir

Theodolite: Component parts of transit Theodolite, Micro optic theodolite, fundamental lines temporary adjustment, measurement of horizontal angles by repetition & reiteration method, measurement of vertical angles, deflection angles, magnetic bearing, lining in by Theodolite, balancing in by Theodolite, prolonging a straight line, laying off horizontal angle, use of Theodolite as a level, Use of Distomat for measuring distances

Total station: Introduction, components, adjustments, various uses,

Text Books:

1. Surveying & Leveling, Basak N., 1st Edition , Tata McGraw Hill, 2004
2. Surveying Vol. I and II, Duggal S.K., 2nd Edition , Tata McGraw Hill, Ind, 2004

Reference Books:

1. Surveying & Leveling Practice, Anderson J. M. and Mikhail E. M., 7th Edition, McGraw Hill, 1998
2. Surveying Principles and Applications, Kavanagh, 7th Edition, Prentice Hall, 2007
3. Surveying Fundamentals & Practices, Nathanson, Lanzafama and Kissam, 5th Edition, Prentice Hall, 2006
4. Surveying, Moffitt and Bossler, 10th Edition, Prentice Hall, 1998

CE 406 - GENERAL PROFECIENCY - II

Teaching Scheme: 02 P Total = 02
Evaluation Scheme: Internal = 50

Credit : 1
Total Marks : 50

Specific format for written communication like business correspondence, formal reports, technical proposals, research papers and articles, advertising and graphics. Format for day to day written communication like application, notices, minutes, quotations, orders, enquiries etc.

Oral communications – important objectives of interpersonal skills, (verbal and non verbal), face to face communications, group discussion and proposal interviews. Methodology of conduction of meetings, seminars, symposia, conferences and workshops.

Assignment on

1. NLP workshop Part I
2. NLP workshop Part II
3. Ice breaking
4. Interview rehearsal
5. Communication practice I
6. Communication practice II
7. Body language I
8. Body language II

Text Books:

1. Communication skill, Leena Sen, Printice Hall of India, 2000
2. Basic Communication Skills for Technology, Rutherford, 2/e Pearson Education India , 2001

Reference Books:

1. Communicate to Win, Kogan Page , 2006
2. Communication at Work: Principles and Practices for Business and the Professions, Adler, Ronaold B, 6th ed., McGraw Hill, 1999
3. Communication skill, John Bench, John Wiley & Sons, 1992
4. Communication skill Revised, Prasad P., S.K. Kataria & Sons , 2000
5. Effective communication for professionals and executives, Bowbrick, Peter, Graham & Trotman, 1988

CE407- FLUID MECHANICS –II-LAB

Teaching Scheme: 02 P Total = 02
Evaluation Scheme: Internal = 25; External = 25

Credit : 1
Total Marks: 50

List of Experiments

1. Study of reciprocating pumps- determination of efficiency
2. Study of Centrifugal pumps- determination of efficiency
3. Study of Pelton wheel turbine - component parts and their functions, working, determination of efficiency.
4. Study of Francis turbine - component parts and their functions, working, determination of efficiency
5. Study of hydraulic jump in laboratory tilting flume- determination of conjugate depths, length of jump, loss of head
6. Calibration of laboratory Venturiflume
7. Study of non-uniform flow in prismatic channel
8. Study of Modern Pumps such as Jet pumps, submersible pumps, Turbine pumps- their characteristics, collection of monograms/performance characteristics/

Lab Report:

Lab Report shall consist the detailed report on experiments conducted and studied.

Practical Examination:

Practical examination shall consist of oral examination based on Lab Report

CE408 - CONCRETE TECHNOLOGY-LAB

Teaching Scheme: 02 P Total = 02
Evaluation Scheme: Internal = 25; External = 25

Credit : 1
Total Marks: 50

- Minimum 8 experiments mentioned below shall be performed by each student.
- A Lab Report on experiments conducted shall be submitted by each student.
Practical examination shall be viva voce based on the practical and syllabus of the course.

List of Experiments-

1. Fineness of cement
2. Soundness of cement
3. Consistency of cement

4. Setting time of cement
5. Compressive strength of cement
6. Sieve analysis of aggregate (fine and coarse)
7. Bulking of sand
8. Silt content of sand
9. Workability of concrete: slump test
10. Workability of concrete: compaction factor test
11. Workability of concrete: flow table test
12. Mix design by IS method (compulsory)
13. Compressive strength of concrete
14. Study of NDT methods for concrete

CE409 - SURVEYING-I -LAB

Teaching Scheme: 04 P Total = 04
Evaluation Scheme: Internal = 50; External = 50

Credit : 2
Total Marks: 100

List of Experiments-

1. Distance measurement by chain & tape including ranging
2. Chaining and offsetting
3. Measurement of bearing by prismatic compass
4. Cross staff survey
5. Chain & compass traversing (plotting of traverse on A1 size sheet)
6. Plane table surveying (plotting of traverse on A1 size sheet)
7. Use of Dumpy level and auto level for simple & differential levelling
8. Use of digital level for levelling
9. Profile leveling for minimum 500 m length (Plotting of L-section & cross section of road on A1 size sheet)
10. Block contouring for minimum 200x200 m area (Plotting of contour map on A1 size sheet)
11. Measurement of area by planimeter
12. Use of Theodolite for measurement of horizontal angles by different methods
13. Use of Theodolite for measurement of deflection angle and vertical angles
14. Use of Theodolite for measurement of magnetic bearing, prolonging straight lines, lying off horizontal angles.
15. Use of Micro-optic theodolite for measuring horizontal and vertical angles.
16. Use of Total station for measurement of distances, angles and levels.

Lab Report:

1. Field book containing the records of data related with all practical
2. Drawing on Full imperial size sheets for following :
 - i) Chain and compass survey
 - ii) Plane table surveying
 - iii) Profile leveling
 - iv) Block counterering

Practical Examination

Practical examination shall consist of practical performance for a given problem in field and viva voce based on Lab Report