

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY
CIRCULAR NO.SU/Engg./B.E.IInd Yr./03/2017

It is hereby informed to all concerned that, the syllabi prepared by the Committees & recommended by the Dean, Faculty of Science & Technology, the **Academic Council at its meeting held on 20 & 21 June 2017 has accepted the following syllabi in accordance with Choice Based Credits & Grading System for all Branches Second Year Engineering & Master of Computer Application Third Year** under the Faculty of Science & Technology as enclosed herewith.

Sr.No.	Syllabi as per CBC & GS
[1]	Second Year B.E.[Civil Engineering],
[2]	Second Year B.E [Mechanical Engineering],
[3]	Second Year B.E [EE/EEE/Electrical, Electronics & Power,],
[4]	Second Year B.E [Chemical Engineering],
[5]	Second Year B.E [Instrumentation Engineering],
[6]	Second Year B.E [E&TC/E&C/IE/ECT],
[7]	Second Year B.E [CSE/IT].
[8]	Third Year MCA

This is effective from the Academic Year 2017-2018 and onwards.

All concerned are requested to note the contents of this circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
 Aurangabad-431 004.
 REF.NO.SU/B.E.IIND & MCA/
 2017/ 2139-72
 Date:- 28-06-2017.

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(Signature)
Deputy Registrar,
Syllabus Section

Copy forwarded with compliments to :-

- 1] **The Principals, affiliated concerned Colleges, Dr. Babasaheb Ambedkar Marathwada University.**
- 2] The Director, University Network & Information Centre, UNIC, with **a request to upload this Circular on University Website.**

Copy to :-

- 1] The Director, Board of Examinations & Evaluation,
- 2] **The Section Officer, [Engineering Unit] Examination Branch,**
- 3] The Section officer, [Eligibility Unit],
- 4] **The Programmer [Computer Unit-1] Examinations,**
- 5] **The Programmer [Computer Unit-2] Examinations,**
- 6] The In-charge, [E-Suvidha Kendra],
- 7] The Public Relation Officer,
- 8] The Record Keeper,

SCHEME AND DETAILED SYLLABUS

Of

SE (Civil Engineering)

Under Choice Based Credit & Grading System

(w.e.f. academic year 2017-18 & onwards/-)

FOUR YEAR DEGREE COURSE IN SCIENCE & TECHNOLOGY



Dr. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,

AURANGABAD

Part- I

Sub Code	Semester-I	Contact Hrs/Week				Examination Scheme						Duration of Theory Examination
	Subject	L	T	P	Total	CT	TH	TW	PR	Total	credits	
BSH201	Engineering Mathematics -III	4	--	--	4	20	80	--	--	100	4	3 Hrs
CED202	Strength of Materials	4	--	--	4	20	80	--	--	100	4	3 Hrs
CED203	Fluid Mechanics-I	4	--	--	4	20	80	--	--	100	4	3 Hrs
CED204	Surveying-I	4	--	--	4	20	80	--	--	100	4	3 Hrs
CED205	Concrete Technology	4	--	--	4	20	80	--	--	100	4	3 Hrs
CED221	LabI: Strength of Materials	--	--	2	2	--	--	25	25	50	1	
CED222	Lab II: Fluid Mechanics-I	--	--	2	2	--	--	25	25	50	1	
CED223	Lab III: Surveying-I	--	--	2	2	--	--	25	25	50	1	
CED224	LabVI:Concrete Technology	--	--	2	2	--	--	50	--	50	1	
CED225	Lab V:Computer Lab	--	--	2	2	--	--	50	--	50	1	
	Total	20	--	10	30	100	400	175	75	750	25	

L: Lecture hours per week

T: Tutorial hours per week

CT: Class Test

TW: Term Work

TH: University Theory Examination

P: Practical hours per week

PR: Practical/Oral Examination

Part-II

Sub Code	Semester-II	Contact Hrs/Week				Examination Scheme						Duration of Theory Examination
	Subject	L	T	P	Total	CT	TH	TW	PR	Total	credits	
BSH251	Engineering Mathematics-IV	4	-	--	4	20	80	--	--	100	4	3 Hrs
CED253	Building Construction And Drawing	4	-	--	4	20	80	--	--	100	4	3 Hrs
CED254	Fluid Mechanics-II	4	-	--	4	20	80	--	--	100	4	3 Hrs
CED255	Surveying-II	4	-	--	4	20	80	--	--	100	4	3 Hrs
CED256	Theory of Structure- I	4	-	--	4	20	80	--	--	100	4	3 Hrs
CED271	Lab VI: Building Construction and Drawing	--	-	4	4	--	--	50	25	75	2	
CED272	Lab VII: Fluid Mechanics-II	--	-	2	2	--	--	25	25	50	1	
CED273	Lab VIII: Surveying-II	--	-	2	2	--	--	25	25	50	1	
CED274	Lab XI: Computer Lab II	--	-	2	2	--	--	25	--	25	1	
BSH275	Lab 10: Communication Skills-I	--	-	4	4	--	--	50	--	50	2	
	Total	20	-	14	34	100	400	175	75	750	27	

L: Lecture hours per week

T: Tutorial hours per week

CT: Class Test **TW:** Term Work

TH: University Theory Examination

P: Practical hours per week

PR: Practical/Oral Examination.

BSH201: Engineering Mathematics-III

Teaching Scheme

Theory: 4Hrs/week

Credits: 4

Examination Scheme

Theory Examination: 80 Marks (3 hrs.)

Class Test: 20 Marks

Objective:-

- To develop Logical understanding of the subject.
- To develop mathematical skill so that students are able to apply mathematical methods & Principles.
- In solving problems from engineering fields.
- To produce graduates with mathematical knowledge & computational skill.

Unit1: Linear Differential Equations: [8 hrs.]

Linear Differential Equations with constant coefficients General method, shortcut methods to find particular integral, Homogenous Linear differential equations (Cauchy's & Legendre's form), method of variation of parameters.

Unit2: Application of Linear Differential Equations: [6 hrs.]

To Electrical circuits & to Mechanical system (Analogous study of two systems), To Civil Engineering, Free oscillations/vibrations, forced oscillation/vibrations, Damped Free oscillations / vibrations, Damped Forced oscillations/vibrations.

Unit3: Fourier Transform: [6 hrs.]

Fourier Transform, Fourier sine and cosine transform Fourier integral, Fourier sine and cosine integral.

Unit4: Statistics & Probability: [8 hrs.]

Measures of central Tendency and Measures of Dispersion (for grouped data only), Karl Pearson's coefficient of skewness, Probability distribution for random variable, Binomial and Normal Distributions Regression and Correlation.

Unit5: Vector Differentiation: [6 hrs.]

Differentiation of vectors, Gradient of scalar point function, Directional derivative, Divergence of vector point function, Curl of a vector point function. Irrotational and solenoidal vector field.

Unit 6: Vector Calculus (Integral Calculus): [6 hrs.]

The line integral, Surface integral, volume integral, Gauss Divergence theorem, Stoke's theorem, Green's theorem (All theorem without proof).

Note:

Section A: Unit 1, 2, 3

Section B: Unit 4, 5, 6

Reference Books:

1. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publications, New Delhi.
2. H.K. Das, "Advanced Engineering Mathematics", S. Chand & Company.
3. B. V. Ramana, "Higher Engineering Mathematics", (Tata McGraw-Hill).
4. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley Eastern Ltd.
5. Ravish R Singh, Mukul Bhat, "Engineering Mathematics", A Tutorial Approach, and McGraw Hill.
6. S.C. Gupta and V.K. Kapoor, "Fundamentals of Mathematical Statistics", S. Chand and Sons.
7. P.N. Wartikar and J.N. Wartikar, "A Text Book of Engineering Mathematics (Volume-I, II, III)", Pune Vidyarthi Griha Prakashan, Pune.

Pattern of Question Paper:

The units in the syllabus shall be divided into two equal sections. Question papers shall be set having two sections A and B. Section A questions shall be set on first three units (1, 2, 3) and Section B questions on remaining three units (4, 5, 6). Question papers should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions.
2. Five questions in each section.
3. Question No. 1 and 6 be made compulsory and should have at least EIGHT bits of two marks out of which FIVE to be solved.
4. Two questions from remaining questions from each section be

asked to solve having weightage of 15 marks.

CED202: Strength of Materials

Teaching Scheme

Theory: 4Hrs. /week
Credits: - 4

Examination Scheme

Theory Examination: 80 Marks (3hrs)
Class Test: 20 Marks

Objective: -

- To understand the basic concept of Stress-Strain and their relation in various types of materials with various types of loading.
- To give an ability to apply the knowledge of strength of materials on engineering applications and design problems.
- To analyze isotropic structural members subjected to axial forces and temperature variations.
- To study the concept of principal stresses and strains in structural members.

Unit 1: Simple Stresses and Strain [7 hrs.]

Mechanical properties of different materials, Direct Stress, Shear Stress, Complimentary Shear Stress, their deformations and corresponding strengths, stress-strain relationship, uniaxial loading, elastic constants and their relationship. Hooke's Law. Stress-Strain diagrams and their characteristics for mild steel, tor steel and concrete. Factor of safety and working stresses. Temperature stresses for uniform and composite section.

Unit 2: Shear and bending moment diagrams [7 hrs.]

Concept of shear force and bending moment. Relationship between bending moment, shear force and intensity of loading. Shear force and bending moment diagrams for simply supported, cantilever, overhanging beams due to concentrated loads, uniformly varying load, uniformly distributed load and couples. Bending moment and loading diagrams from given shear force diagram, shear force and loading diagram from given bending moment diagrams.

Unit 3: Stresses in Beams: [7 hrs.]

Theory of simple bending and pure bending, assumptions, derivation of flexure formula, section modulus, moment of resistance, bending stresses in solids, hollow and built up sections, flinched beams.

b) Shear Stresses: Shear stresses in beams, assumptions, derivation of shear stress formula, distribution of shear stress for various cross sections. Maximum and average shear stress for circular and rectangular section.

Unit 4: Torsion and Strain Energy: [7 hrs.]

Theory of torsion and assumptions. Derivation of torsion equation, polar modulus, stresses in solid and hollow circular shaft, power transmitted by shaft.

b) Strain energy: Concept, Expression for strain energy for axially loaded member under gradual, sudden and impact load, shear resilience, strain energy due to self-weight, shear, bending and torsion.

Unit 5: Principle stresses and strains: [7 hrs.]

Concept of principle plane, principal stresses, normal and shear stresses, resultant stress on oblique plane, magnitude and orientation of principle stresses and maximum shear stresses, Mohr's circle method.

Direct and bending stresses: combined direct and bending stresses, concept of core (Kernel) of section for rectangular and circular sections, application to short column with eccentric loads, chimneys and retaining walls involving lateral forces.

Unit 6: Columns and struts:

[5 hrs.]

Axially loaded compression members, short and long column different end condition. Euler's theory and Rankin's Theory and IS Code formulae. Limitation of Euler's formula, column with initial curvature, laterally loaded struts. Thin Cylinders and Spheres subjected to internal pressure.

Reference Books:

1. **Mechanics of Materials** by Pytel and Singer, McGraw hill New Delhi.
2. **Mechanics of Materials- Vol-I**, S. B. Junnarkar, Charotar publisher.
3. **Mechanics of Materials**, Timoshenko and Gere, Tata McGraw hill New Delhi.
4. **Mechanics of Materials**, E. P. Popov, prentice hall of India Pvt. Ltd.
5. **Strength of Materials**, R. K. Rajput, S. Chand.
6. **Strength of Materials**, S. Ramamurtham, Dhanpat rai and sons.

Pattern of Question Paper:

The units in the syllabus shall be divided in two equal sections, question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6). Question paper should cover the entire syllabus.

For 80 marks paper:

1. Minimum ten Questions.
2. Five questions in each section.
3. Question no 1 and 6 made compulsory and should have at least ten bits of two marks out of which FIVE to be solved.
4. Two questions from remaining questions from each section be asked to solve having weight age of 15 marks.

CED203: Fluid Mechanics-I

Teaching Scheme

Theory: 4Hrs. /week

Credits: - 4

Examination Scheme

Theory Examination: 80 Marks (3 hrs.)

Class Test: 20 Marks

Objective: -

- To understand the properties of fluids and fluid statics.
- Study analytical solutions to variety of simplified problems.
- Understand the dynamics of fluid flows and the governing non-dimensional parameters.
- Apply concepts of mass, momentum and energy conservation to flows.
- To solve kinematic problems such as finding particle paths and stream lines.

UNIT 1: Introduction: [4 hrs.] [Theoretical & Analytical]

Relevance of Fluid Mechanics, Definition of Fluid and Fluid Mechanics, Properties of Fluids, Dynamic and Kinematic Viscosity, Newton's Law of Viscosity, Rheology, Ideal, Real Fluids, Newtonian and Non Newtonian Fluids, Classification of Fluids, Compressibility, Cohesion, Adhesion, Surface Tension, Capillarity, Vapor Pressure.

UNIT 2: Fluid Static and Buoyancy: [8 hrs.] [Theoretical & Analytical]

a) Concept of Pressure Head, Fluid Pressure at a Point, Pressure Variation in a Fluid at Rest, Pascal's Law, The Basic Equation of Hydrostatics and its Application, Measurement of Pressure: Simple Manometers, Differential Manometers and Precision Manometers. Hydrostatic Forces on Plane and Curved Surfaces Centre of Pressure, Total Pressure, Pressure Diagrams, Practical Applications.

b) Principle of Floatation and Buoyancy, Equilibrium of Floating Bodies, Stability of Floating Bodies, Metacenter, Metacentric Height and its Determination, (Experimental & Analytical), Relative Equilibrium.

UNIT 3: Fluid Kinematics:[8 hrs.] [Theoretical & Analytical]

- a) Fluid in Motion, Classification of Fluid Flow, Steady, Unsteady, Uniform, Non Uniform, Laminar, Turbulent, Rotational, Irrotational, One-, Two- and Three- Dimensional Flows. Continuity Equation, Continuity Equation in Three Dimensional Flows in Cartesian Coordinates. Velocity Potential, Stream Function, Equi-Potential Lines, Flow Net and its Application, Free and Forced Vortex Flow.
- b) Viscous Flow: Relation between Shear Stress and Pressure Gradient, Flow of Viscous Fluid through Circular Pipe, Hagen Poissuille's Equation.

UNIT 4: Fluid Dynamics: [4 hrs.] [Theoretical & Analytical]

Forces Acting on Fluids in Motion, Euler's Equation of Motion along Streamline, Bernoulli's Equation- Assumptions, Applications and Limitations.

UNIT 5: Measurement of Flow: [8 hrs.] [Theoretical & Analytical]

Various instruments used for measuring flow like -

- A) Venturimeter B) Pitot tube C) Orifices: Classification, Hydraulic Coefficients, Experimental and Analytical Determination of Hydraulic Coefficient, Flow Through an Orifice, Discharge through Large Rectangular Orifice, Fully Sub-Merged and Partially Sub-Merged Orifice D) Mouthpieces: Classification, Flow through an External Cylindrical, Convergent-Divergent and Borda's Mouthpiece E)Notches and Weirs: Classification, Discharge over Rectangular, Triangular, Trapezoidal, Stepped Notches, Error in Measurement of Head, Velocity Approach, Francis's and Bazin's Formulae, Cipolletti, Broad Crested, Narrow Crested, Ogee, Drowned Weir.

UNIT 6: Turbulent Flow and Flow through Pipes:[8 hrs.][Theoretical & Analytical]

- a) Characteristics of Flow, Instantaneous Velocity, Temporal Mean Velocity, Scale of Turbulence and Intensity of Turbulence, Velocity Distribution and Shear Stresses in Turbulent Flow, Prandtl's Mixing Length Theory, Calculation of Head Loss, Introduction to Moody's Chart.
- b) Energy Losses in Pipe Flow (Major Losses and Minor Losses), Darcy Weisbach Equation, Variation of Friction Factor for Laminar Flow and for Turbulent Flow, Flow through

Pipes Such as Simple, Compound, Series Parallel, Branched Pipes, Equivalent Pipes, Siphon, Three Reservoir Problems Under Steady State, Flow through Siphon.

Reference Books:

1. Hydraulics and Fluid Mechanics, Modi & Seth Standard Book House.
2. Fluid Mechanics and Hydraulic Machines, R.K.Bansal Laxmi Publications.
3. Fluid Mechanics and Hydraulic Machines, S. Ramamrutham Dhanpatrai Publications.
4. Fluid Mechanics, V.L. Streeter & E.B. Wylie TMH.
5. Flow through open channel, Subramanyam.
6. Fluid Mechanics and Hydraulic Machines by Domkundwar & Domkundwar.

Pattern of Question Paper:

The units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6) . Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 and 6 be made compulsory and should have at least ten bits of two marks out of which FIVE to be solved.
4. Two questions from remaining questions from each section be asked to solve having weight age of 15 marks.

CED204: Surveying-I

Teaching Scheme

Theory: 4Hrs/week

Credits: - 4

Examination Scheme

Theory Examination: 80 Marks (3 hrs.)

Class Test: 20 Marks.

Objective: -

- To understand the importance of surveying in the field of civil engineering.
- To study the basics of linear/angular measurement methods like chain surveying, compass surveying.
- To study the significance of plane table surveying in plan making.
- To know the basics of leveling and theodolite survey in elevation and angular measurements.
- To understand tachometric surveying in distance and height measurements.

UNIT 1: Introduction to Surveying: [6 hrs.]

- a) **Introduction:** Definition of surveying, Objectives and importance of surveying, Classification of surveys, Principles of surveying, Units of measurements, Surveying measurements and errors, types of errors, precision and accuracy, Classification of maps, map scale, conventional symbols, topographic maps, map layout, Survey of India Map numbering systems.
- b) **Measurement of Horizontal Distances:** Measuring tape and types, Measurement using tapes, Taping on level ground and sloping ground, Errors and corrections in tape measurements, ranging of lines, direct and indirect methods of ranging, Booking of tape survey work, Field book, entries, Conventional symbols, Obstacles in tape survey, Numerical problems.

UNIT 2: Compass and Theodolite Survey:

[10 hrs.]

- a) **Measurement of Directions and Angles: Compass survey:** Basic definitions; meridians, bearings, magnetic and True bearings, Prismatic and surveyor's compasses, temporary adjustments, declination. Quadrantal bearings, whole circle bearings, local attraction and related problems.
- b) **Theodolite Survey and Instrument Adjustment:** Theodolite and types, Fundamental axes and parts of Transit theodolite, uses of theodolite, Temporary adjustments of transit theodolite, measurement of horizontal and vertical angles, step by step procedure for obtaining permanent adjustment of Transit theodolite.

Traversing: Traverse Survey and Computations: Latitudes and departures, Traverse adjustments, Bowditch rule and transit rule, Numerical Problems.

UNIT 3:Plane Table Survey:

[4 hrs.]

Introduction, accessories used in plane table survey, Adjustments of plane table. Methods of plane table and their suitability.

UNIT 4:Leveling, Contouring and Trigonometric Leveling:

[12 hrs.]

a) Leveling: Basic terms and definitions, Methods of leveling, Dumpy level, auto level, digital and laser levels, Curvature and refraction corrections, Booking and reduction of levels, differential leveling, profile leveling, fly leveling, and check leveling, reciprocal leveling.

b) Contouring: Contours, Methods of contouring, Interpolation of contours, contour gradient, characteristics of contours and uses.

c) Trigonometric leveling: Heights and distances-single plane and double plane methods.

UNIT 5:Computation of Areas and Volumes:
hrs.]

[4

Measurement of area – by dividing the area into geometrical figures, area from offsets, mid ordinate rule, trapezoidal and Simpson's one third rule, area from co-ordinates, introduction to planimeter, digital planimeter. Measurement of volumes-trapezoidal and prismoidal formula.

UNIT 6:Tachometry:

[4 hrs.]

Basic principle, types of tachometry, distance equation for horizontal and inclined line of sight in fixed hair method, problems.

Text Books:

1. B.C. Punmia, "Surveying Vol.1 &2", Laxmi Publications pvt. Ltd., New Delhi – 2009.
2. Kanetkar T P and S V Kulkarni, Surveying and Leveling Part I & II, Pune Vidyarthi Griha Prakashan, 1988
3. S.K. Duggal, "Surveying Vol.1&2", Tata McGraw Hill Publishing Co. Ltd. New Delhi. – 2009.
4. K.R. Arora, "Surveying Vol. 1" Standard Book House, New Delhi. – 2010

5. Surveying – By David Clark

6. Surveying – By Norman Thomas

Pattern of Question Paper:

The Units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6). Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 and 6 be made compulsory and should have at least ten bits of two marks out of which FIVE to be solved.
4. Two questions from remaining questions from each section be asked to solve having weightage of 15 marks.

CED205: Concrete Technology

Teaching Scheme

Theory: 4Hrs/week

Credits: - 4

Examination Scheme

Theory Examination: 80 Marks (3hrs.)

Class Test: 20 Marks

Objective: -

- To understand the properties of ingredients of concrete.
- To study the behavior of concrete at its fresh and hardened state.
- To study about the concrete design mix.
- To understand special concrete and their use.
- To study the use of Admixtures in concrete.

Unit 1: Introduction to concrete as a construction material: [8 hrs.]

- a) **Cement** – Introduction to manufacture of Portland cement, ingredients of cement, hydration of cement, types of cement, tests on cement. Different types of Pozollanic materials (Fly ash, Rice Husk ash, Metakaolin) their properties.
- b) **Aggregate and water** – classification, mechanical properties, physical properties, deleterious materials, soundness, Alkali-aggregate reaction, sieve analysis: fineness tests on aggregates, artificial and recycled aggregate, Quality of water required for mixing and curing, tests on water. Use of sea water in making concrete
- c) **Admixture** – Modern concrete admixtures and constructions chemicals, plasticizers, super plasticizers, retarders, accelerators, air entraining agents , water proofing materials functions, IS: specifications (9103 and 456), compatibility of admixture.

Unit 2: Properties, Production and Placement of Concrete: [6 hrs.]

- a) **Fresh concrete:** workability – factors affecting workability, cohesion and segregation, bleeding, workability tests, mixing- handling, placing and compaction of concrete, curing methods, time- strength relationship
- b) **Hardened concrete:** strength of concrete, factors affecting strength, micro-cracking and stress-strain relationship, strength properties and factors affecting them, relation between tensile and compressive strengths, impact strength, abrasion resistance, elasticity and creep, shrinkage and swelling.

Unit 3: Testing of Concrete and Formwork: [6 hrs.]

- a) **Testing of concrete:** Destructive and Non-destructive testing: Compressive and tensile strength test, Pullout test, Rebound hammer, Ultrasonic pulse velocity, Split Tensile test.
- b) **Formwork:** Types, basic members in form work and principles of design, Materials for formwork construction, causes of failure of formwork and safety precaution.

Unit 4: Concrete Mix Design: [6 hrs.]

Concepts of Mix Design, Factors affecting proportioning, Factors to be considered, common terminologies, Statistical quality control, Methods of Mix Design by IS 10262, ACI and BS(DoE) codes, Mix design of High strength Concrete by ACI method, Factors affecting high strength concrete.

Unit 5: Special Concretes and Special Concreting Techniques: [8 hrs.]

- a) Introduction to concrete related equipment: batching plants, hauling, pumps, mixers and vibrators.
- b) Special concrete: light weight concrete, polymer concrete, types of fibers, fiber reinforced concrete, high density concrete, self-compacting concrete and applications.
- c) Special concreting techniques: pumping of concrete, under water concreting, ready mixed concrete, roller compacted concrete.

d) Use of wastes in concrete such as plastics, glass, rubber, fibers etc.

Unit 6: Deterioration and repairs: [6 hrs.]

a) **Deterioration:** Permeability and durability, chemical attack and sulphate 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.

Text/reference books

1. Concrete by Mehta and Monterio, Mcgraw Hill Publications.
2. Concrete by Mindees, young and Darwin, Prentice Hall Publications.
3. Concrete technology by M.L. Gambhir, Tata McGrew Hill publications.
4. Concrete technology by M.S.Shetty, S.Chand Publications.
5. Concrete technology by A.R. Santhakumar, Oxford University Press.
6. Handbook on Non- Destructive Testing of concrete by Malhotra and Carnio, RC Press.
7. Properties of concrete by A.M.Neville, Longman Publishers.
8. Concrete technology by R.SVarshney, Oxford and IBH.
9. Concrete technology by A.M.Neville, J.J.Brooks, Addison Wesley.
10. Engineered Concrete by Irving Kett, CRC Press.

Pattern of Question Paper:

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For 80 marks Paper:

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 and 6 be made compulsory and should have at least ten bits of two marks out of which FIVE to be solved.
4. Two questions from remaining questions from each section be asked to solve having weightage of 15 marks.

BSH251: Engineering Mathematics-IV

Teaching Scheme

Theory: 4Hrs/week

Credits: - 4

Examination Scheme

Theory Examination: 80 Marks (3hrs.)

Class Test: 20 Marks

Objective: -

- To develop Logical understanding of the subject.
- To develop mathematical skill so that students are able to apply mathematical methods & Principal's in solving problems from Engineering fields.
- To produce graduates with mathematical knowledge & computational skill.

Unit1:Laplace transform:

[6hrs.]

Definition, transforms of elementary functions, Properties & theorems of Laplace transforms (without proof), transforms of periodic function, Heaviside unit step function, displaced unit step function, Dirac delta function, error function, Bessel' function of zero order.

Unit2:Inverse Laplace transform and its applications:[6 hrs.]

Inverse Laplace transforms by using (i) properties, ii) partial fractions, iii) Convolution theorem, Applications to solve linear differential equations with constant coefficients (Initial value problems), Simultaneous Linear differential equations.

Unit3:Partial Differential Equations and its Applications: [8 hrs.]

Formation of partial differential equation by eliminating arbitrary constant and function, equation solvable by direct integration, linear equations of first order (Lagranges's linear equation), non-linear equation of first order: (i) form $f(p, q) = 0$, (ii) $f(z, p, q) = 0$, Charpits Methods, method of separation of variable, solution of one dimensional heat flow equation, two dimensional heat equation, wave equation.

Unit4: Numerical Methods and Curve Fitting: [8hrs.]

Solution of transcendental equations by Newton Raphson method, Gauss Seidel method to solve simultaneous linear equations, Lagranges interpolation formula for unequal intervals, numerical differentiation: Newton's forward and Newton's Backward difference

formulae, Solution of ordinary differential equation by Euler Modified method and Runge-Kutta IVth order method, Curve fitting: Principle of least squares, Fitting of linear curve, parabola, exponential curve

Unit5: Function of complex variable (Differential calculus): [6hrs.] Introduction, Analytic function Cauchy Riemann equations in Cartesian and Polar form, Harmonic function, Laurent's series (without proof), conformal mapping: Translation, Magnification, Rotation and inversion, bilinear transformation.

Unit6: Function of complex variable (Integral calculus): [6hrs.] Line integral, contour integral: Cauchy's integral theorem, Cauchy's integral formula, Residues, Cauchy's residue theorem (All Theorems without proof).

Note:

Section A: Unit 1, 2, 3

Section B: Unit 4, 5, 6

Reference Books:

1. P. N. Wartikar and J. N. Wartikar, *A Text Book of Engineering Mathematics* (Volume-I, II, III), Pune Vidyarthi Griha Prakashan, Pune.
2. B.S. Grewal, "*Higher Engineering Mathematics*", Khanna Publications, New Delhi
3. H.K. Das, "*Advanced Engineering Mathematics*", S. Chand & Company.
4. B.V. Ramana, "*Higher Engineering Mathematics*", (Tata McGraw-Hill).
5. Erwin Kreyszig, "*Advanced Engineering Mathematics*", Wiley Eastern Ltd.
6. Ravish R Singh, Mukul Bhat, "*Engineering Mathematics A Tutorial Approach*", by, McGraw Hill.

Pattern of Question Paper:

The units in the syllabus shall be divided into two equal sections. Question papers shall be set having two sections A and B. Section A questions shall be set on first three units (1, 2, 3) and Section B questions on remaining three units (4, 5, 6). Question papers should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 and 6 be made compulsory and should have at least EIGHT bits of two marks out of which FIVE to be solved.
4. Two questions from remaining questions from each section be asked to solve having weightage of 15 marks.

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CED253: Building Construction & Drawing

Teaching Scheme

Theory: 4Hrs/week

Credits: - 4

Examination Scheme

Theory Examination: 80 Marks (3hrs.)

Class Test: 20 Marks

Objective:-

- To understand the principles of planning and bylaws.
- To draw plan, elevation and section of load bearing and framed structures.
- To draw plan, elevation and section of public and industrial structures.
- To prepare detailed working drawing.

Unit 1: Introduction: [6 hrs.]

Definition, types of buildings as per National Building Code, components of buildings and their functions, Types of structure – load bearing structure & framed structures, their relative advantages & disadvantages, load bearing walls- applications, advantages, materials required and construction procedure. Partition walls- applications, advantages, materials required and construction procedure.

Unit 2: Functional planning of building: [8 hrs.]

Principles of Building Planning- Aspect, Prospect, Roominess, Orientation, circulation, grouping of areas, privacy, Economy, etc. Concept and design of Energy efficient buildings. Relevant knowledge of Building Bye Laws. Requirements for preparation of Line Plan, Working Drawings (Plan, Elevation & Section) & Submission drawings (with Area calculations)

Unit 3: Foundation: [6 hrs.] Definition and necessity, loads on foundation, Bearing Capacity of soil, SBC values based on IS code. Types of foundation – shallow foundation & deep foundations for buildings, spread footings for walls & columns, Raft foundations, Foundations in black cotton soils, pile foundation, precautions to be taken & Causes of failure of foundations. Underpinning. Setting out foundations, excavation for foundations.

Unit 4: Special Aspects of Construction: [10 hrs.]

Waterproofing techniques, damp proofing – causes of dampness, its effects, various methods of damp proofing, material used for damp proofing, details of cavity wall construction. Termite Proofing, Fire proof construction – Points to be observed during planning

& construction. Fire protection requirements for multistoried building. Sound proof Construction – Sound absorbents and their characteristic, factors affecting the acoustical design of an auditorium. Joints – Expansion & construction joints necessity, details of expansion joint at foundation level & roof level of load bearing structure and framed structure. Provision of construction joints in slabs, beams & columns.

Unit 5: Building components and their basic requirements: [4 hrs.]

Foundations, plinth, walls and columns in superstructure, floors, doors & windows, sills, lintels and weather sheds, roofs & Toilets. Stairs – Function, technical terms, criteria for location, types of staircases, their suitability, principle of stair layout & its design. Lifts, Ramps & Escalators their suitability.

Unit 6: Miscellaneous: [6 hrs.]

Safety in construction: safety on site, storage of materials, construction safety, prevention of accidents, Introduction to repairs and retrofitting in buildings. Shoring- Purpose, types, suitability, Scaffolding- Purpose, types, suitability. Wall cladding: materials, methods, wall papering and glazing work.

Recommended Books:

1. **Building Construction** - B.C.Punmia.
2. **The Text book of Building Construction** – S.P. Arora & S.P. Bindra.
3. **Principles of building drawing** - M.G. Shah & C.M. Kale
4. **Building construction** - Sharma & Kaul
5. **Construction Engineering** - Y. S. Sane
6. **Building Construction (Vol. I, II & III)** - W.B. Markay
7. **National Building Code of India: S.P. 7**

Pattern of Question Paper:

The units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6) . Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 and 6 be made compulsory and should have at least ten bits of two marks out of which FIVE to be solved.
4. Two questions from remaining questions from each section be asked to solve having weight age of 15 marks.

CED254: Fluid Mechanics-II

Teaching Scheme

Theory: 4Hrs/week

Credits: - 4

Examination Scheme

Theory Examination: 80 Marks (3 hrs.)

Class Test: 20 Marks.

Objective:-

- To widen the horizon of the subject already learnt as a basic course in the first part of it.
- It is also intended that the subject learns the applications of the subject in the form of various hydraulic machines.
- To classify the types of flows in open channel and also to design open channel sections in a most economical fashion with minimum wetted perimeter and learn about critical flows.
- To develop an understanding of fluid flow patterns and learn to use boundary layer theory and drag.

UNIT 1: Flow through Open Channels: [10 hrs.] [Theoretical & Analytical]

a) Introduction to Open Channel: Classification of Channels, Steady and Unsteady Flow in Open Channels, Uniform and Non-Uniform Flows, Laminar and Turbulent Flows, Gradually and Rapidly Varied Flows, Velocity Distribution in Open Channels.

b) Uniform Flow in Open Channel: Geometric Shapes of Channel Sections and their Expressions, Economic Channel Sections, Basic Equations of Fluid Flow i.e. Continuity Equation, Momentum Equation, Bernoulli's Equation applied to Channel Flow, Chezy's and Manning's Equations.

c) Depth-Energy Relationships in Open Channel: Specific Energy Diagrams, Alternate Depths, Froude Number, Specific Force, Critical Depth, Critical Flow, Conditions for Occurrence of Critical Flow, Flow Classification Based on it.

UNIT 2: Non Uniform Flow in Channels: [6 hrs.] [Theoretical & Analytical]

Gradually Varied Flow, (GVF), Slope Profiles, Computation of GVF by Direct Step Method, Measurement of Flow in Channels, Standing Wave Flume, Venturiflume, Rapidly Varied Flow, Hydraulic Jump, and Hydraulic Jump as Energy Dissipater.

UNIT 3: Boundary Layer Theory: [4 hrs.] [Theoretical & Analytical]

Concept of Boundary Layer, Thickness of Boundary Layer, Types of Boundary Layer, Separation of Boundary Layer. Forces on Immersed Bodies in Flowing Fluids, General Equations, Lift, Drag, Aerofoil, Magnus Effect.

UNIT 4: Impact of Jets and Turbines: [10 hrs.] [Theoretical & Analytical]

a) Dynamics of Force, Momentum, Impulse Momentum Equation, Jet Force on Stationary and Moving Flat & Curved Vanes, Inlet and Outlet Velocity Triangles, Series of Flat and Curved vanes Mounted on Wheel, Jet Propulsion.

b) Classification of Turbines, Impulse and Reaction Turbines, Components and Their Functions, (Pelton Wheel, Radial Flow Reaction Turbine, Francis Turbine, Axial Flow Reaction Turbine) Efficiency and Characteristics of Turbines, Specific Speed, Unit Speed, Unit Power, Unit Discharge, Selection Criterion for Turbines, Cavitations, Draft Tube, Runway Speed, Surge Tank.

UNIT 5: Pumps: [6 hrs.] [Theoretical & Analytical]

a) Centrifugal Pumps: Components, Types, Construction, Principle of Working, Efficiencies, Characteristic and Specific Speed under Various Operation Conditions, Priming of Pumps, Self Priming, Multistage Centrifugal Pumps

b) Reciprocating Pumps: Classification, Working Principle, Work Done, Effect of Acceleration and Frictional Resistance, Slip Separation in Suction and Delivery Pipes, Indicator Diagram

UNIT 6: Dimensional Analysis: [4 hrs.] [Theoretical & Analytical]

Dimensions of Physical Quantities, Dimensional Homogeneity, Dimensional Analysis using Rayleigh Method & Buckingham's π Theorem Method, Similitude, Important Dimensionless Parameters, Reynold's No., Froude No. and Their Significance, Scale Factors.

Recommended Books

1. Hydraulics and Fluid Mechanics, Modi & Seth Standard Book House.
2. Fluid Mechanics and Hydraulic Machines, R.K.Bansal Laxmi Publications.
3. Fluid Mechanics and Hydraulic Machines, S. Ramamrutham Dhanpatrai Publications.
4. Fluid Mechanics, V.L. Streeter & E.B. Wylie.
5. Flow through open channel, Subramanyam.
6. Fluid Mechanics and Hydraulic by Dr. S. K. Ukarande, Ane Books Pvt. Ltd.
7. Fluid Mechanics and Hydraulic Machines by Domkundwar & Domkundwar.

Section A-Unit I, II, III

Section B-Unit IV, V, VI

Pattern of Question Paper:

The units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1, 2, 3) and Section B questions on remaining three units (4, 5, 6). Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions.
2. Five questions in each section.
3. Question no 1 and 6 be made compulsory and should have at least ten bits of two marks out of which FIVE to be solved.
4. Two questions from remaining questions from each section be asked to solve having weight age of 15 marks.

CED255: Surveying - II

Teaching Scheme

Theory: 4Hrs/week

Credits: - 4

Examination Scheme

Theory Examination: 80 Marks (3hrs.)

Class Test: 20 Marks

Objective:-

- To understand the basics and elements of different types of curves on roads and their preliminary survey.
- To learn about surveying applications in setting out of curves, buildings, and culverts.
- To get introduced to different geodetic methods of survey such as triangulation, trigonometric leveling.
- To learn about errors in measurements and their adjustments in a traverse.
- To get introduced to modern advanced surveying techniques involved such as Remote sensing, Total station, GPS, Photogrammetry etc.

UNIT 1: Curve surveying: [12 hrs.]

Curves – Necessity – Types, Simple curves, Elements, Designation of curves, Setting out simple curves by linear methods (numerical problems on offsets from long chord & chord produced method), Setting out curves by Rankine's deflection angle method (numerical problems). Compound curves, elements, design of compound curves, setting out of compound curves (numerical problems). Transition curves characteristics, numerical problems on length of Transition curve, Vertical curves –Types – (theory).

UNIT 2: Geodetic Surveying:

[6 hrs.]

a) Geodetic Surveying: Principle and Classification of triangulation system, Selection of base line and stations, Orders of triangulation, Triangulation figures, Reduction to Centre, Selection and marking of stations.

b) Theory of Errors: Introduction, types of errors, definitions, laws of accidental errors, laws of weights, theory of least squares, rules for giving weights and distribution of errors to the field observations, determination of the most probable values of quantities.

UNIT 3: Engineering Surveys: [2 hrs.]

Setting out work Building, culverts, bridges and tunnels, route surveys, city surveying and topographical surveys.

UNIT 4: Aerial Photogrammetry: [6 hrs.]

Introduction, uses, aerial photographs, definitions, general idea of terrestrial photogrammetry, aerial photogrammetry, scale of vertical and tilted photograph (simple problems), relief displacements (derivation), ground control, procedure of aerial survey, overlaps and mosaics, stereoscopes.

UNIT 5: Remote Sensing and GIS: [8 hrs.]

a) Remote Sensing: Introduction, Principles of energy interaction in atmosphere and earth surface features, Image interpretation techniques, visual interpretation. Digital image processing, Global Positioning system

b) Geographical Information System: Definition of GIS, Key Components of GIS, Functions of GIS, Spatial data, spatial information system Geospatial analysis, Integration of Remote sensing and GIS and Applications in Civil Engineering (transportation, town planning).

UNIT 6: Modern Instruments: [6 hrs.]

a) Modern Surveying Instruments: Introduction, Electromagnetic spectrum, Electromagnetic distance measurement, Total station – working and operating principle, phase correction techniques, modulation components, data observations, accuracy, handling precautions, set up of total Station, Applications-generation of property maps of Total Station. Data transformation with post processing software's.

b) Hydrographic Surveying:

Introduction, Soundings, Methods of locating soundings, horizontal and vertical control, nautical sextant, ranges, plotting of soundings.

Text Books:

1. B.C. Punmia, "Surveying Vol.2", Laxmi Publications pvt. Ltd., New Delhi.
2. Surveying and Levelling, Kanetkar T. P. and S. V. Kulkarni, Vol.-1, Vol.-2, Pune, Vidyarthi Griha Prakashan,
3. K.R. Arora, "Surveying Vol. 1" Standard Book House, New Delhi.
4. Sateesh Gopi, Global Positioning System, Tata McGraw Hill Publishing Co. Ltd. New Delhi.

Reference Books:

1. S.K. Duggal, "Surveying Vol. I & II", Tata McGraw Hill Publishing Co. Ltd. New Delhi.
2. R. Subramanian, Surveying and Leveling, Second edition, Oxford University Press, New Delhi.
3. David Clerk, Plane and Geodetic Surveying Vol 1 and Vol 2, CBS publishers
4. B. Bhatia, Remote Sensing and GIS, Oxford University Press, New Delhi.
5. T.M. Lillesand, R.W. Kiefer and J.W. Chipman, Remote sensing and Image interpretation, 5th edition, John Wiley and Sons India.
6. James M. Anderson and Edward M. Mikhail, Surveying theory and practice, 7th Edition, Tata McGraw Hill Publication.

Pattern of Question Paper:

The Units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units (4,5,6). Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 and 6 be made compulsory and should have at least ten bits of two marks out of which FIVE to be solved.
4. Two questions from remaining questions from each section be asked to solve having weightage of 15 marks.

CED256: Theory of Structure - I

Teaching Scheme

Theory: 4Hrs/week

Credits: - 4

Examination Scheme

Theory Examination: 80 Marks (3 hrs.)

Class Test: 20 Marks

Objective:-

- To understand the knowledge on the theory and application of structures in buildings.
- To understand the difference between determinant and indeterminate structure.
- To understand the methods of analysis of determinant and indeterminate structure.

Unit 1: [6 hrs.]

Riveted and Welded connections: Riveting, bolted joints, types of riveted and bolted joints, failure of riveted joints, strength riveted joints, design of riveted joints, for axially loaded member, design of fillet weld and butt weld.

Eccentric connections: Riveted joints subjected to moment action in plane of the joint, design of eccentric connection.

Unit2: [10 hrs.]

Curvature, slope and deflection: Curvature, slope and deflection of statically determinate beams, cantilevers, propped cantilevers, macaulay method, moment area method and conjugate beam method.

Deflection of statically determinate structure: Castigliaon's theorem, deflection of beams and frames by strain energy, deflection of pin jointed trusses, effect of temperature change, willot diagrams.

Unit 3: Fixed beams: [4 hrs.]

Relation between free bending moment diagram and Fixed bending moment diagram. Beams with different moment of Inertia, effect of sinking of support.

Unit 4: Continuous beams: [4 hrs.]

Calpeyroms theorem of three moments, beam with diff MI, effect of sinking of support.

Unit 5:[8hrs.]

Rolling loads and Influence lines for statically determinate structure: Rolling loads and Influence lines for statically determinate structure for reaction, bending moment and shearing force for cantilever and simple and compound beams. Criteria for maximum bending moments and maximum shearing force for simple determinate beams.

Unit 6:

[8 hrs.]

Three hinged Arches: determination of horizontal thrust, bending moment radial shear and normal thrust, for parabolic and segmental three hinged arches.

Three hinged suspension bridge: Simple suspension cable, anchor cable, suspension bridge with three hinged stiffening girder. Influence line diagram for horizontal reaction at cable support and for bending moment and shearing force at a given section in three hinged stiffening girder.

Recommended Books

1. **Analysis of Structures (Vol. 1 and Vol. 2):** Vazirani and M.M.Ratwani
2. **Theory of Structures:** S. Ramamurthum
3. **Theory of Structures:** Timoshenko and Young
4. **Theory and Analysis of Structures (Vol. 1 and Vol. 2):** Jain and Jain
5. **Mechanics of Structures:** S.B. Junnerkar

Pattern of Question Paper:

The units in the syllabus shall be divided in two equal sections. Question paper shall be set having two sections A and B. Section A questions shall be set on first three units (1,2,3) and Section B questions on remaining three units(4,5,6). Question paper should cover the entire syllabus.

For 80 marks paper:

1. Minimum ten Questions
2. Five questions in each section
3. Question no 1 and 6 made compulsory and should have at least ten bits of two marks out of which FIVE to be solved.
4. Two questions from remaining questions from each section be asked to solve having weight age of 15 marks.

CED221 LAB I: Strength of Materials

Teaching Scheme

Practical: 2 Hrs/week

Credit: 1

Examination Scheme

Term work: 25 marks

Oral Examination: 25 Marks

Term Work: The term work shall consist of Experiments given below (any seven):

1. Tension test on mild steel.
2. Bending test on mild steel.
3. Shear test on mild steel.
4. Brinell hardness test (three metal specimens), Rockwell hardness test on mild steel.
5. Izod and Charpy impact test on any three metals.
6. Torsion test on mild steel.
7. Bending test on timber.
8. Flexure test on flooring tiles.
9. Water absorption and compression test on burnt bricks.

The assessment of term work shall be done on the basis of the following:

- Continuous Assessment.
- Performing the experiment given in laboratory.

Oral Examination:-

The practical examination shall consist of performing an exercise based on the practical work done during the course. The record of the exercises submitted by the candidate and viva-voce on the syllabus. The assessment will be based on

- 1) Performing an Exercise.
- 2) Record of exercise submitted by the candidate.

CED222 LABII: Fluid Mechanics - I

Teaching Scheme

Practical: 2 Hrs/week

Credit: 1

Examination Scheme

Term work: 25 marks

Oral Examination: 25 Marks

Term Work: The term work shall consist of Experiments given below (any seven):

1. Study of pressure measuring devices.
2. Determination of metacentric height.
3. Verification of Bernoulli's equation.
4. Calibration of Venturimeter and Orificemeter.
5. Determination of coefficient of discharge for an orifice and mouthpiece.
6. Determination of minor losses through pipe.
7. Determination of pipe friction factor.
8. Calibration of rectangular notch/ triangular notch.
9. Determination of Reynold's Number.

The assessment of term work shall be done on the basis of the Following:

- Continuous Assessment
- Performing the experiment given in Laboratory

Oral Examination:-

The practical examination shall consists of performing an exercises based on the practical work done during the course. The record of the exercises submitted by the candidate and viva – voce on the syllabus. The assessment will be based on

- 1) Performing an exercise.
- 2) Record of exercise submitted by the candidate.

CED223 LABIII: Surveying - I

Teaching Scheme

Practical: 2 Hrs/week

Credit: 1

Examination Scheme

Term work: 25 marks

Oral Examination: 25 Marks

Term Work: (A) The term work shall consist of Experiments given below (any seven):

1. Measuring of Bearing of Traverse Lines, Calculations of Included Angles and check.
2. Study of Dumpy level and Reduction of Levels.
3. Profile, fly, differential and Check Leveling.
4. Study and use of plane table survey by Radiation and Intersection.
5. Measurements of Direct, Deflection Angle and Magnetic bearing with the Theodolite.
6. Measurement of Horizontal and Vertical angle by simple method. Face left and faces right observations.
7. Measurement of Horizontal Angle by Repetition and Reiteration method.
8. Determining distance and reduce level of elevation point by Tachometric observations.

(B) PROJECT: All are Compulsory

1. Block contouring
2. Road project
3. Theodolite Traverse

The assessment of term work shall be done on the basis of the following:

- Continuous Assessment
- Performing the experiment given in laboratory

Practical Examination:-

The practical examination shall consists of performing an exercises based on the practical work done during the course. The record of the exercises submitted by the candidate and viva –voice on the syllabus. The assessment will be based on

- 1) Performing an exercise.
- 2) Record of exercise submitted by the candidate.

CED224 LABIV: Concrete Technology

Teaching Scheme

Practical: 2 Hrs/week

Credit: 1

Examination Scheme

Term work: 50 marks

Term Work: Term Work shall consist of following experiments

1. Fineness, initial and final setting time, normal consistency, soundness and compressive strength of cement.
2. Specific gravity and density, Silt content of fine aggregate, sieve analysis, flakiness and elongation, moisture content, Impact Value and crushing Value of aggregate, Moisture content.
3. Workability of concrete by slump test, compaction factor, Vee Bee test, effect of admixture and retarders on setting time concrete.
4. Compressive and tensile strength of hardened concrete, Rebound hammer test.
5. Concrete mix design by IS code method and ACI method

The assessment of term work shall be done on the basis of the following:

- Continuous Assessment
- Performing the experiment given in Laboratory

CED225 LABV: Computer Lab- I

Teaching Scheme

Practical: 2 Hrs/week

Credit: 1

Examination Scheme

Term work: 50 marks.

Term work:

A. Introduction to AutoCAD: Basic Drawing commands

1. Draw Commands : Line, Polygon, Rectangle, Circle, Ellipse.
2. Edit Commands : Erase, Copy, Mirror, Offset, Extend, Array, Move, Rotate, Scale,
3. Coordinate Entry : X,Y,Z, coordinate entry system, Angular measurement, Absolute Coordinate entry, Relative coordinate's entry, And Polar coordinate entry system.
4. Osnap : Endpoint, Intersection, Nearest, Midpoint, Tangent, Center.
5. Qnew/Open/Save/Exit: Qnew, Open, Save, Exit
6. Layers : Create new layer, Assign layer color, Assign layer linetype.
7. Dimensioning : Using dimensions
8. Text in A Drawing : Dtext, DDedit, MText, MEdit
9. Zoom Commands : Zoom realtime, Zoom window, Zoom previous, Zoom all, Pan Realtime.
10. View ports : Aerial View, Named View, Tiled View ports.
11. Typical Drawing Setup : Ortho, Snap, Units, Limits, Zoom all. Set Layers, LtScale, Text Style. LWT, Undo/Redo
12. Plot Command :

B. The following assignments need to be submitted on A-3 size sheet.

1. Assignment No. 1- Drawing 2-D Objects like Rectangle, Circle, and Ellipse.
2. Assignment No. 2- Drawing 2-D Line Plan of Building.
3. Assignment No. 3- Drawing 2-D Double line Plans for Buildings.
4. Assignment No. 4- Drawing Foundation Plan for above building.
5. Assignment No. 5- Drawing detailed section of Staircase & Toilet.

The assessment of term work shall be done on the basis of the following:

- Continuous Assessment
- Performing the experiment given in Laboratory

CED271 LAB VI: Building Construction and Drawing

Teaching Scheme

Practical: 4Hrs/week

Credits: 2

Examination Scheme

Term work: 50 marks

Oral Examination: 25 Marks

Term work

Part- I

- 1) Measured drawing (including site visit) - drawn to suitable scale on Full Imperial sheet.
- 2) Data drawing (G+1) Residential Bungalows Plan- drawn to Suitable scale on Full Imperial sheet.
- 3) Details of Data Drawing- Location Plan, Block Plan, Septic Tank details, Compound wall details
- 4) Submission drawing of Data drawing.

Part-II

- 1) Preparation of working drawing plans in suitable scale for 1, 2 & 3 BHK flats, Bungalow and Apartment (G+3) Building.
- 2) Sketches – Shoring, Underpinning, scaffolding, Partition walls, Damp proofing courses, Thermal insulations, air conditioning system, ventilations.
- 3) Preparation of above drawings by AutoCAD (Part I)

The assessment of term work shall be done on the basis of the following:

- Continuous Assessment.
- Performing the experiment given in Laboratory.

Oral Examination:-

The practical examination shall consist of performing an exercise based on the practical work done during the course. The record of the exercises submitted by the candidate and viva – voce on the syllabus.

The assessment will be based on

- 1) Performing an exercise.
- 2) Record of exercise submitted by the candidate.

CED272 Lab VII: Fluid Mechanics-II

Teaching Scheme

Practical: 2 Hrs/week

Credit: 1

Examination Scheme

Term work: 25 marks

Oral Examination: 25 Marks

Term Work: The term work shall consist of Experiments given below (any six):

1. Determination of Chezy's and Manning's constants.
2. Determination of co-efficient of discharge for Venturi-flume / Standing wave flume.
3. Study of hydraulic jump.
4. Impact of Jet.
5. Trial on turbine.
6. Trial on centrifugal pump.
7. Trial on reciprocating pump.
8. Study of Charts for Selection of Pumps

The assessment of term work shall be done on the basis of the Following:

- Continuous Assessment
- Performing the experiment given in Laboratory

Oral Examination:-

The practical examination shall consist of performing an exercise based on the practical work done during the course. The record of the exercises submitted by the candidate and viva – voce on the syllabus.

The assessment will be based on

- 1) Performing an exercise
- 2) Record of exercise submitted by the candidate.

CED273 Lab VIII: Surveying-II

Teaching Scheme

Practical: 2 Hrs/week

Credit: 1

Examination Scheme

Term work: 25 marks

Oral Examination: 25 Marks

Term Work: (A) The term work shall consist of Experiments given below

1. Setting out simple circular curve by offsets from long chord method.
2. Setting out simple circular curve by offset from chord Produced.
3. Setting out simple circular curve by Rankine's method.
4. Study of Nautical sextant and measurement of angle by nautical sextant.
5. Study of Mirror Stereoscope.
6. Satellite station and reduction to center.
7. Study of Total Station
 - (A) Measurement of Horizontal and Vertical angle
 - (B) Measurement of area of traverse.

(B) Mini Projects;

1. Setting out Building/culvert.
2. Using Total Station Block Contouring (minimum 30 sq.m)

The assessment of term work shall be done on the basis of the following:

- Continuous Assessment
- Performing the experiment given in Laboratory

Oral Examination:

The practical examination shall consist of performing an exercise based on the practical work done during the course. The record of the exercises submitted by the candidate and viva –voice on the syllabus.

The assessment will be based on

1. Performing an exercise.
2. Record of exercise submitted by the candidate.
3. Viva-voice on the syllabus.

CED274 Lab IX:Computer Lab II

Teaching Scheme

Practical: 2 Hrs/week

Credit: 1

Examination Scheme

Term work: 25 marks

Term work:

Following is the suggested list of the exercise for the subject **Computer Lab- II** and should solve by writing programs in 'C' language. The program should be error free and desired output should be obtained.

1. **Survey-II:** Two problems each from section –A & section- B of survey –II.
2. **F.M.-II:** Two problems each from section –A & section-B of F.M.-II.
3. **Exercises to be taken on Numerical methods:**
 - a) Newton Raphson Method
 - b) Lagrange's Interpolation Formula
 - c) Solution of simultaneous equation by Gauss Elimination
 - d) Fourth order RungeKutta Method

The assessment of term work shall be done on the basis of the following:

- Continuous Assessment
- Performing the experiment given in Laboratory

BSH 275: Communication Skill-I

Teaching scheme

Practical : 04 hrs /week

Credit : 2

Examination scheme

Term work / Oral Exam : 50 Marks

The teacher shall explain in detail, the gist and techniques involved in the following work units to the students. The teacher shall subsequently formulate the exercises to adjudge the skill sets acquired by the students.

Unit 1: Time Management [4 hrs.]

Value of time, Diagnosing Time Management, Weekly Planner to do list and Prioritizing work.

Unit 2: Grammar and Usage [8 hrs.]

Overview of basic Mid-level English Grammar, Parts of speech, Preparations and Conditions, Tense and Concept of time, Sentence Construction (Concord), Vocabulary: Words, Idioms, Phrases, Antonyms and Synonyms

Unit 3: Speaking Skills [8 hrs.]

Training in Sound Recognition, the speech process, message, audience, speech style, feedback, conversation and oral skills, fluency and self-expression body language phonetics and spoken English, speaking techniques, word stress, correct stress patterns, voice quality, correct tone, types of tones, Presentation skills-planning, preparation, organization, Stress and Intonation pattern in spoken communication, Sound Recording Exercise (Language Lab Exercise), Communication Errors in English

Unit 4: Listening and Reading Skills [8 hrs.]

Active and Passive Listening, the reading process, purpose, different kinds of texts, reference material, scientific and technical texts, active and passive reading, strategies-vocabulary skills, eye reading and visual perception, Skimming and scanning reading, drawing inferences and conclusions, comprehension of technical material- scientific and technical texts, instructions and technical manuals, graphic information. Note making-tool for study skills.

Unit 5: Writing Skills [6 hrs.]

Identification of different writing styles (Four Writing Style), Types of reports, information and analytical reports, oral and written reports, formal and non-formal

reports, printed forms, letter and memo format, manuscript format, proposals, technical articles, journal articles and conference papers, Drafting: Memo, Circulars, Notices, agendas etc. E-mails, Business Memos / Letters, Employment Communication- resume design, resume style.

Unit 6: Developing Skills and Presentations

[6 hrs.]

Developing key traits 1: creativity, critical thinking and problem solving. Effective Presentations- Gathering Information and Building Presentation. Presentation by students in team.

Text Books:

1. 'Effective Technical Communication' by M Ashraf Rizvi, Tata McGraw Hill Publishing Company Ltd.
2. 'Basic Managerial Skills for all' E. H. McGrath, Eastern Economy Edition, Prentice hall India.
3. 'Developing Communication Skills' Krishna Mohan, Meera Banerji, McMillan India Ltd.
4. 'Skills' Krishna Mohan, Meera Banerji, McMillan India Ltd.

Term Work:

Term work marks should be given on the basis of online test conducted internally at college level.