SEMESTER III

SYLLABUS	(SEMESTER-III)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
Subject Code:	CE203TBS05	3	1	0	15	15	30	70	100	4
Subject:	Engineering Mathematics-III									

Course Objectives:

The students will be able

- To use of the concepts of correlation, Regression and various types of distributions.
- To provide students with the skills, knowledge and attitudes required to determine approximate numerical solutions to mathematical problems which cannot always be solved by conventional analytical techniques, and
- To demonstrate the importance of selecting the right numerical technique for a particular application, and carefully analysing and interpreting the results obtained.

Course Content:

UNIT-1 Correlation & Regression: Scatter diagram, Linear Correlation, Measures of Correlation. Karl Pearson's Coefficient of correlation, Limits for correlation coefficients, Coefficient of correlation for vicariate frequency distribution, Rank correlation, Linear Regression, Equations to the line of Regression. Regression coefficient. Angle between two lines of Regression.

UNIT–2 Theoretical Distributions: Discrete and Continuous probability distribution's Mathematical expectation, Mean and Variance, Moments, Moments generating function, probability distribution, Binomial, Poisson and Normal distribution, Test of significance based on chi-square,T,F, and Z distribution, degree of freedom , conditions for applying X2 (chi-square) test , student's test.

UNIT-3 Introduction of Errors and their Analysis, types of errors, numerical problems on error analysis, curve fitting: method of least squares; Numerical Solution of Algebraic and Transcendental Equations: Graphical method bisection Method, Secant Method, Regula-falsiMethod, Newton Raphson Method.

UNIT- 4 The Calculus of Finite Differences: Finite differences, Difference formula, operators and relation between operators. Inverse Operator, Interpolation with equal intervals: - Newton's forward and backward interpolation formula. Interpolation with Unequal intervals: - Lagrange's interpolation Newton's difference formula, inverse interpolation.

UNIT- 5 Numerical Differentiation and Integration: - Numerical Differentiation Newton's forward and Backward difference interpolation formula. Maxima and Minima of a Tabulated function, Numerical Integration:-Trapezoidol rule, simpson's (1/3) rd and (3/8) th rule, Boole's rule, weddle rule.

Text Books:

1) Prasad C "Advanced Engineering mathematics",
2) Dass H.K. "Advanced Engineering mathematics",
3) Ray M. "Mathematics statistics",
4) HigherEngg. Mathematics by Dr. B.S. Grewal– KhannaPublishers.,
5) Advanced Engg. Mathematics by Erwin Kreyszig – John Wiley & Sons,
6) Advanced Engg.Mathematics by R.K. Jain and S.R.K. Iyengar – Narosa Publishing House.,
7) Applied Mathematics by P.N.Wartikar& J.N. Wartikar. Vol- II– Pune VidyarthiGrihaPrakashan,Pune.
8) JAIN & IYNGAR Numerical Methods for Scientific and Engineering Computations.
9) RAO G.S. Numerical Anlysis.
10) Grewal B S Numerical Methods in Engineering and Science.
11) Rajaraman V., Computer Oriented Numerical Methods
12) P. Kandasamy K. Thilagavathy, K. Gunavathi, Numerical Methods, S. Chand & Company, 2nd Edition, Reprint 2012.
13) S. S. Sastry, Introduction methods of Numerical Analysis, PHI, 4th Edition, 2005.

Course Outcomes-After successful completion of this course, the students will be able to

CO 1. Apply the statistical concept of correlation regression and distribution, theory with special reforms to engineering problems.
CO 2. Analyse the errors obtained in the numerical solution of problems.
CO 3. Apply appropriate numerical methods, determine the solutions to given non-linear equations.
CO 4. Adopt appropriate numerical methods, determine approximate solutions to systems of linear equations.
CO 5. Solve ordinary differential equations by an appropriate numerical methods.

SYLLABUS	(SEMESTER-III)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
Subject Code:	CE203TPC01	3	1	0	15	15	30	70	100	04
Subject:	Strength of Materials									

Course Objectives:

The objective of this Course is to:

- To develop understanding of mechanical properties to compute response in the material (Stress and Strain) using analytical and graphical method.To apply the fundamentals of simple stresses and strains.
- To analysis the structural element (Beam) for different loading condition to obtain design parameters (BM, SF, Slope and Deflection)
- To determine and study stress variation in beams using conceptual theories.
- To learn engineering principles for understanding the behavior of compression member.
- To study theory of torsion in solid and hollow shaft and stresses developed in cylindrical shells.

Course Content:

UNIT-1: Simple Stresses -Strain and compound stresses: Types of stresses and strains, Mechanicals properties, Hooke's law, stress– strain curve for mild & Cast iron, hardness, impact strength, Poisson's ratio, Relation between the elastic moduli & Poisson's ratio, Bars subjected to varying loads, Temperature stresses in composite bars, Elongation of bars of constant and varying sections. Stress at a point. Components of stress in rectangular coordinates, stresses on an inclined plane, Principal stresses &principle plane, Mohr's circle of stresses.

UNIT-2: Shear Force - Bending Moment: Shear Force & Bending Moment diagrams in statically determinate beams loaded with different load combination, Relationship between Load intensity- Shear Force - Bending Moment, Thrust diagram, Point of contra flexure, loading diagram & Bending moment diagram from shear force diagram, beam with internal hinge. Bending Stress

UNIT-3: Shear Stresses in Beams Derivation of Shear Stress formula, assumptions, and Shear stresses in symmetrical elastic beam with different sections.

Slope and Deflections of simple Beams: Derivation of differential equation for deflection, Slope & Deflection of Beams by Double integration method, Macaulay's method & Moment area method.

UNIT -4: Torsion: Equation of Pure Torsion, Assumptions, and Power transmitted, Stiffness of Shafts, Comparison of Solid & Hollow shaft, Strain energy in Torsion.

Columns: Stable and unstable equilibrium, Short columns, Euler's formula for long columns, Equivalent length, Limitation of Euler's formula, Rankine's formula.

UNIT -5: Thin-walled pressure vessels: Cylindrical pressure vessels, Spherical vessels. Thick Cylindrical vessels: Lame's theory, Graphical method for determining stresses Spherical shells.

Text Books:

1. Strength of Materials – R.K. Rajput (S. Chand & Co.)
2. Strength of Materials – R.K. Bansal (Laxmi Publication)
3. Strength of Materials – S.S Ratnam (Tata McGraw Hill)
4. Strength of Materials – Timoshenko, S. & Gere (CBS Publishers)
5. Introductions to Solid Mechanics –Shames &Pitarresi (Prentice Hall of India)
6. Strength of Materials–S. Ramamurtham (DhanpatRai Publications)

Course Outcomes- At the end of the course the students will be able to:

CO 1. Describemechanical properties of material (stress & strain) in two dimensional systems by analytical and graphical method.

CO 2. Analyzestructural member (beams) to evaluate behavioural response (BM, SF, Slope, Deflection) for various loading condition.

CO 3. Estimatetorsional stress in solid and hollow shaft.Analyse various situations involving structural members subjected to bending, shear and torsion.

CO 4. Characterize and analyzethe types of columnon the basis of engineering theories.

CO 5. Evaluatestresses variation in thin and thick cylindrical shells.

SYLLABUS	(SEMESTER-III)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL	70	100	03
Subject Code:	CE203TPC02	3	0	0	15	15	30			
Subject:	Fluid Mechanics- I									

Course Objectives:

- To introduce the fundamentals of Fluid Mechanics, its properties, behaviour, forces on various surfaces and stability of submerged and floating body.
- To develop understanding about Kinematics of fluid flow.
- To imbibe basic law of energy and equation used for analysis of dynamic fluids.
- To introduce the importance of fluid Flow in Pipes and determine the losses in a flow system.
- To develop understanding aboutflow through mouthpieces and orifices.

Course Content:

UNIT-1: Introduction: Fluid, physical properties of fluids ideal and real fluid, Newtonian and Non-Newtonian Fluid Statics: Pressure density height relationship, pressure measurement by Manometers, Pressure on plane and curved surfaces, centre of pressure, buoyancy, stability of immersed and floating bodies, metacentric height.

UNIT-2: Kinematics of fluid flow : Steady and unsteady flow, uniform and non-uniform flow, laminar and turbulent flow, one, two and three dimensional flow, streamlines and path lines, rotational and irrotational flow, continuity equation, three dimensional continuity equation. Velocity potential and stream function.

UNIT-3: Dynamics of fluid flow: Euler's equation of motion along a streamline and its integration, Bernoulli's equation and its applications – Pitot tube, Venturimeter, orificemeter, and application of momentum equations.

UNIT-4: Flow in Pipes: Major and minor losses in pipe lines, loss due to sudden contraction & expansion, Pipes in series and parallel Flow in open Channel: Comparison between open channel and pipe flow, definition of uniform and non-uniform flow, Chezy's and Manning's Formula, Hydraulically efficient channel section of rectangular, trapezoidal.

UNIT -5: Flow through mouthpieces and orifices: Hydraulic coefficients of orifice, flow through large rectangular orifice, mouthpieces, Borda's mouthpieces. Notches and Weirs: Rectangular, triangular and trapezoidal notches and weir, cippoletti and broad crested weir.

Text Books:

1. Fluid Mechanics and Machines – Dr. A.K. Jain (Khanna Publications)
2. Fluid Mechanics and Machines – Dr. R.K. Bansal (Laxmi Publications)
3. Fluid Mechanics & Hydraulic Machines – Dr.P.N.Modi&S.M.Seth,(Narosa Publishing House)

Reference Books:

1. Mechanics of Fluid – Irving H. Shames (McGraw Hill)
2. Introduction to Fluid Mechanics – James A. Fay (Prentice Hall India)
3. Fluid Mechanics – R.J. Garde (New Age International Publication)
4. Fluid Mechanics – V.L. Streeter &E.B. Wylie (Tata McGraw Hills)
5. Fluid Mechanics – John F Dougles (Pearson Publication)
6. Introduction to Fluid Mechanics-R.W. Fox, and A.T. McDonald (John Wiley & Sons).
7. Fluid Mechanics-V.L. Streeter and W.E. Benjamin, (Tata McGraw Hills).
8. Fluid Mechanics and Fluid Mechanics-S.K. Som and G. Biswas, (Tata McGraw Hill).

Course Outcomes- At the end of the course students will be able to

CO 1. Define fluid properties and state the Newton's law of viscosity with explain the mechanics of fluid at rest
CO 2. Describe the Kinematics of fluid flow.
CO 3. Employ Bernoulli's equation for ideal and real fluid flow and deduce expressions for Venturimeter, orifice meter and pitot tube.
CO 4. Explain the concept of Flow in Pipes and types of losses in pipe flow.
CO 5. Describe Flow through mouthpieces &orifices and distinguish it
.

SYLLABUS	(SEMESTER-III)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
Subject Code:	CE203TPC03									
Subject:	Building Materials &Construction	3	0	0	15	15	30	70	100	03

Course Objectives:
- To introduce the basic engineering properties of building materials like brick, stones, timber, ceramics, plastics, etc.
- To understand the elementary characteristics of construction materials like cement aggregates, concrete, steel, etc.
- To understand the types of foundations, functions, types of masonry, lintels, etc.
- To learn the structure supporting method like Shoring, Underpinning, and other advanced construction materials & Techniques.

Course Content:

UNIT- 1: Stones, Bricks, Tiles, Timber; Properties, Classification &Uses

UNIT-2: Miscellaneous Engineering Materials; Ceramics & glass; Plastics & Rubber; Paints, Varnishes and distempers; Composite materials; Adhesives; Thermal, Electrical & Sound Insulators.

UNIT 3: Cement, Aggregate, Concrete and Steel; classification, properties & uses.

UNIT-4: Foundations, Masonry, Arches & Lintels; Classification, Requirements & Uses.

UNIT-5: Shoring, Underpinning, Formwork, Advanced construction materials & Techniques.

The relevant IS Codes for all the materials and NBC.

Text Books:

1. Building Materials – S.K. Duggal (New Age Publication)
2. Building Materials – S. C. Rangwala (Charotar Publication)
3. Building Construction by S.G. Rangwala, Charter Publishing House, Anand, India.
4. Building Construction by Sushil Kumar, Standard Publ. and Distributors, New Delhi
5. Building Construction by Punmia B.C., Lakshmi Publications, New Delhi.
6. Advanced Building Materials and Construction by Mohan Rai and Jai Sing, CBRI Publications, Roorkee
7. Concrete Technology – A.M. Neville & J.J. Brooks (Pearson Education)
8. Concrete Technology – M.S. Shetty (S. Chand & Co.)
9. Engineering Materials – Surendra Singh (Laxmi Publication)
10. Construction Engineering and Management – S. Seetharaman (UmeshPublication)
11. Building Materials – Gurucharan Singh (Standard Publishers, Delhi

Course Outcomes-At the end of the course students will be able

CO 1. To compare the properties of most common and advanced building materials.
CO 2. To choose the typical and potential applications of these materials
CO 3. To select the appropriate building material for building construction
CO 4. To identify the different components of a building and differentiate various types of foundations, masonry arches and lintels
CO 5. To select the appropriate supporting structure for strengthening of the buildings.

SYLLABUS	(SEMESTER-III)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL	70	100	03
Subject Code:	CE203TPC04	3	0	0	15	15	30			
Subject:	Surveying & Geomatics									

Course Objectives:
- To understand the Concepts of levelling & its application on the field.
- To learn about the concepts of theodolites, tacheometry& triangulation.
- To understand subsidiary surveying like photographic & hydrographic surveying.
- To learn to apply advanced application of surveying like Remote sensing, EDM.

Course Content:

Unit 1:Levelling & Contouring: Temporary and permanent adjustment of levels. Sensitivity of bubble tube, Levelling staff, Types of levelling: - Reciprocal, Profile, Differential, Plotting of profiles Correction: - curvature and refraction.CONTOURING; Introduction to contouring, definitions, contour interval, equivalent, uses and characteristics of contour lines, direct and indirect methods of contouring.

Unit 2:Theodolite and Tacheometry: Vernier theodolites, Temporary and permanent adjustments, Requirements of nonadjustable parts, Measurement of horizontal angle by repetition and reiteration method, Measurement of vertical angles. TACHEOMETERY: Definitions, Principles of stadia systems. Instrument constants, Substance and Tangential Systems. Construction and use of Reduction Tacheometers. CONTOURING; Introduction to contouring.

Unit 3: Triangulation: Principle and classification of Triangulation System, Strength of Figures, Station marks and Signals, Satellite station, intersected and Resected points.

Plane Table Surveying**:** Principles, Advantages and disadvantages, Plane table equipment, Use of Telescopic Alidade, Different methods of Plane Table Surveying. Area and volume measurements

Unit 4: Photographic& Hydrographic Surveying: Photo theodolite, principle of the method of terrestrial photogrammetry, scale and distortion of the vertical and tilted photograph.HYDROGRAPHIC SURVEYING: Introduction, shore line survey, soundings methods

Unit 5: (A) Principle of Electronic Distance Measurement: Principle, Type, Use, Measurement, Modulation, Types of EDM instruments, Distomat, Total Station – Parts of a Total Station – Accessories –Advantages and Applications.**(B) Remote Sensing:** Introduction –Electromagnetic Spectrum, interaction of electromagnetic radiation with the atmosphere and earth surface, remote sensing data acquisition: platforms and sensors, Introduction to GPS

Text/Reference Books:

1. B.C Punamia, A.K Jain, Surveying Vol. 1 & 2, Laxmi Publications.
2. Madhu, N, Sathikumar, R and Satheesh Gobi, Advanced Surveying: Total Station, GIS and Remote Sensing, Pearson India, 2006.
3. Bhavikatti, S.S., Surveying and Levelling, Vol. I and II, I.K. International, 2010
4. Manoj, K. Arora and Badjatia, Geomatics Engineering, Nem Chand & Bros, 2011

Course Outcomes-

At the end of the course students will be able to:
CO 1.   Adopt thebasics concepts, techniques and perform surveying activities using the instruments.
CO 2.   Applyvarious methods and carryout the levelling
CO 3.   Implement the working principles of various surveying instruments
CO 4.   Carryout Hydrographic, Electronic Distance Measurement in surveying and adopt Global Positioning System use Photogrammetry and apply Remote Sensing.

SYLLABUS	(SEMESTER-III)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
Subject Code:	CE203THS03	L	T	P	CT-I	CT-II	TOTAL			
Subject:	Professional Practice, Law & Ethics	2	0	0	15	15	30	70	100	02

Course Objectives:

- To know about roles of various stakeholders in formulating standards of practice and to learn about ethical values in professionalism.
- To study general principles of contracts management and practice involvingtender proposal.
- To understand ADR mechanism like arbitration, conciliation, LokAdalat in judicial system.
- To learn legal aspect of labour engagement and other construction related law in civil engineering.
- To understand lawand policy related to Intellectual property,Copyright, Trademarks, Patents and Piracy

Course Content

UNIT 1: Professional Practice – Respective roles of various stakeholders: Government (constituting regulatory bodies and standardization organizations, prescribing norms to ensure safety of the citizens); Standardization Bodies (ex. BIS, IRC)(formulating standards of practice); professional bodies (ex. Institution of Engineers(India), Indian Roads Congress, IIA/ COA, ECI, Local Bodies/ Planning Authorities) (certifying professionals and offering platforms for interaction); Clients/ owners (role governed by contracts); Developers (role governed by regulations such as RERA); Consultants (role governed by bodies such as CEAI); Contractors (role governed by contracts and regulatory Acts and Standards); Manufacturers/ Vendors/ Service agencies (role governed by contracts and regulatory Acts and Standards).

Professional Ethics – Definition of Ethics, Professional Ethics, Business Ethics, Corporate Ethics, Engineering Ethics, Personal Ethics; Code of Ethics as defined in the website of Institution of Engineers (India); Profession, Professionalism, Professional Responsibility, Professional Ethics; Conflict of Interest, Gift Vs Bribery, Environmental breaches, Negligence, Deficiencies in state-of-the-art; Vigil Mechanism, Whistleblowing, protected disclosures.

UNIT 2:

General Principles of Contracts Management: Indian Contract Act, 1972 and amendments covering General principles of contracting; Contract Formation & Law; Privacy of contract; Various types of contract and their features; Valid & Voidable Contracts; Prime and sub-contracts; Joint Ventures & Consortium; Complex contract terminology; Tenders, Request For Proposals, Bids & Proposals; Bid Evaluation; Contract Conditions & Specifications; Critical /"Red Flag" conditions; Contract award & Notice To Proceed; Variations & Changes in Contracts; Differing site conditions; Cost escalation; Delays, Suspensions & Terminations; Time extensions & Force Majeure; Delay Analysis;

Liquidated damages & Penalties; Insurance & Taxation; Performance and Excusable Non-performance; Contract documentation; Contract Notices; Wrong practices in contracting (Bid shopping, Bid fixing, Cartels); Reverse auction; Case Studies; Build-Own-Operate & variations; Public- Private Partnerships; International Commercial Term.

UNIT 3:

Arbitration, Conciliation and ADR (Alternative Dispute Resolution) system: Arbitration – meaning, scope and types – distinction between laws of 1940 and 1996; UNCITRAL model law – Arbitration and expert determination; Extent of judicial intervention; International commercial arbitration; Arbitration agreements – essential and kinds, validity, reference and interim measures by court; Arbitration tribunal – appointment, challenge, jurisdiction of arbitral tribunal, powers, grounds of challenge, procedure and court assistance; Award including Form and content, Grounds for setting aside an award, Enforcement, Appeal and Revision; Enforcement of foreign awards – New York and Geneva Convention Awards; Distinction between conciliation, negotiation, mediation and arbitration, confidentiality, resort to judicial proceedings, costs; Dispute Resolution Boards; LokAdalats.

UNIT 4:

Engagement of Labour and Labour & other construction-related Laws: Role of Labour in Civil Engineering; Methods of engaging labour- on rolls, labour sub-contract, piecerate work; Industrial Disputes Act, 1947; Collective bargaining; Industrial Employment (Standing Orders) Act, 1946; Workmen's Compensation Act, 1923; Building & Other Construction Workers (regulation of employment and conditions of service) Act (1996) and Rules (1998); RERA Act 2017, NBC 2017

UNIT 5:

Law relating to Intellectual property:Introduction – meaning of intellectualproperty, main forms of IP, Copyright, Trademarks, Patents and Designs, Secrets; Law relating to Copyright in India including Historical evolution of Copy Rights Act, 1957, Meaning of copyright – computer programs, Ownership of copyrights and assignment, Criteria of

infringement, Piracy in Internet – Remedies and procedures in India; Law relating to Patents under Patents Act, 1970 including Concept and historical perspective of patents law in India, Patentable inventions with special reference to biotechnology products, Patent protection for computer programs, Process of obtaining patent – application, examination, opposition and sealing of patents, Patent cooperation treaty and grounds for opposition, Rights and obligations of patentee, Duration of patents – law and policy considerations, Infringement and related remedies.

Text Book/ References:

1. B.S. Patil, Legal Aspects of Building and Engineering Contracts, 1974.
2. The National Building Code, BIS, 2017.
3. RERA Act, 2017.
4. Meena Rao (2006), Fundamental concepts in Law of Contract, 3rd Edn. Professional Offset.
5. NeelimaChandiramani (2000), The Law of Contract: An Outline, 2nd Edn. AvinashPublications Mumbai
6. Avtarsingh (2002), Law of Contract, Eastern Book Co.
7. Dutt (1994), Indian Contract Act, Eastern Law House
8. Anson W.R. (1979), Law of Contract, Oxford University Press
9. Kwatra G.K. (2005), The Arbitration & Conciliation of Law in India with case law on UNCITRAL Model Law on Arbitration, Indian Council of Arbitration
10. Wadhera (2004), Intellectual Property Rights, Universal Law Publishing Co.
11. T. Ramappa (2010), Intellectual Property Rights Law in India, Asia Law House
12. Bare text (2005), Right to Information Act
13. O.P. Malhotra, Law of Industrial Disputes, N.M. Tripathi Publishers
14. K.M. Desai(1946), The Industrial Employment (Standing Orders) Act
15. Rustamji R.F., Introduction to the Law of Industrial Disputes, Asia Publishing House
16. Vee, Charles &Skitmore, Martin (2003) Professional Ethics in the Construction Industry, Engineering Construction and Architectural management, Vol.10, Iss2,pp117-127, MCB UP Ltd
17. American Society of Civil Engineers (2011) ASCE Code of Ethics – Principles Study and Application
18. Ethics in Engineering- M.W.Martin&R.Schinzinger, McGraw-Hill
19. Engineering Ethics, National Institute for Engineering Ethics, USA
20. www.ieindia.org
21. Engineering ethics: concepts and cases – C. E. Harris, M.S. Pritchard, M.J.Rabins
22. CONSTRUCTION CONTRACTS, http://www.jnormanstark.com/contract.htm
23. Internet and Business Handbook, Chap 4, CONTRACTS LAW, http://www.laderapress.com/laderapress/contractslaw1.html
24. Contract&Agreements, http://www.tco.ac.ir/law/English/agreements/General/Contract%20Law/C.htm
25. Contracts, http://206.127.69.152/jgretch/crj/211/ch7.ppt
26. Business & Personal Law. Chapter 7. "How Contracts Arise", http://yucaipahigh.com/schristensen/lawweb/lawch7.ppt
27. Types of Contracts, http://cmsu2.cmsu.edu/public/classes/rahm/meiners.con.ppt
28. IV. TYPES OF CONTRACTS AND IMPORTANT PROVISIONS, http://www.worldbank.org/html/opr/consult/guidetxt/types.html
29. Contract Types/Pricing Arrangements Guideline- 1.4.G (11/04/02), http://www.sandia.gov/policy/14g.pdf

Course Outcomes:

At the end of the course student will be able to

CO 1 To describe respective roles of regulatory bodies and ethical practice to be followed by engineering professionals.

CO 2 To define principle of tender filing and contract management.

CO 3 To distinguish between ADR mechanism and formal judicial proceedings for dispute resolution.

CO 4 To explain role of labour and other construction-related laws in civil engineering.

CO 5 To identify law and policy related to Intellectual property, Copyright, Trademarks, Patents and Piracy.

SYLLABUS	(SEMESTER-III)	CREDITS: 1	INTERNAL ASSESSMENT (IA)			ESE
Subject Code:	CE203PPC01	L	T	P	IA		TOTAL	
Subject:	Survey Lab	0	0	2	30	-	30	20

Course Objectives:

The Lab sessions would help in learning:

- Applications of chains & compass in surveying.
- Various Applications of levelling process.
- Use of Plane table surveying in preparing of maps of a location
- Tacheometry& its applications.
- Relative adjustment of non- accessible stations
- Principle & operation of Total Station.

Course Content:

List of experiments:

1. Linear measurement, offsetting & Determination of the area of the given field by cross staff survey & metric chain.
2. Compass open & closed traversing using prismatic compass and elimination of local attraction.
3. To find the difference in elevation between the two non-invisible stations by the method of differential levelling.
4. To draw longitudinal & cross-sectional profile of the road by the method of profile levelling.
5. Measurement of horizontal angle by repetition & reiteration method.
6. Traversing of the given area by radiation & intersection method using plane table survey.
7. Find the plane table instrument station using Resection method (Two-point problem & three-point problem)
8. Determination of Tacheometric constants (K & C).
9. Determination of elevation and height by tangential method when both angles are angles of elevation.
10. Determination of elevation and distance when line of sight inclined Upward & Downward
11. To perform the experiment for reduction to center from different positions of a satellite station when: (i) Satellite station in north position, (ii) Satellite station in left position
12. To perform the experiment for reduction to centre from different positions of a satellite station when: (i) Satellite station in south position, (ii) Satellite station in right position
13. Study of total station

Text Book:

1. Surveying and Leveling. N.N.Basak, 1stEdition, Tata McGraw Hill
2. Surveying (Vol. I & II) – Punmia, B.C. (Laxmi Publications, New Delhi, 1996)
3. Surveying (Vol. I & II) – Kanetkar (Pune VidyarthiGrihaPrakashan, Pune)

Reference Books:

1. Surveying (Vol. II & III) – Agor, R (Khanna publications, Delhi, 1995)
2. Surveying (Vol. II & III) – Arora, K.R. (Standard Book House, Delhi, 1993)
3. Surveying (Vol. I & II) – S.K. Duggal (Tata McGraw Hill)

Course Outcomes-On completion of the course, the students will be able to:

CO 1. Explain the use of conventional surveying tools such as chain/tape, compass, plane table and level in the field of civil engineering applications such as structural plotting and highway profiling etc.

CO 2. Apply the procedures involved in field work and execute the survey work as a surveying team.

CO 3. Plan the surveying and the requirements as per the site and weather conditions.

CO 4. Apply concepts of accurate measurements techniques, field booking, plotting and adjustment of errors.

SYLLABUS	(SEMESTER-III)	CREDITS: 1		INTERNAL ASSESSMENT (IA)			ESE
		L	T	P	IA	-	TOTAL	
Subject Code:	CE203PPC02	0	0	2	30	-	30	20
Subject:	Fluid Mechanics Lab							

Course Learning Objectives:

1. To understand the verification of Bernoulli's Principle.
2. To enrich the concept of Metacentric height
3. To correlate various flow measuring devices such as venturimeter, orifice meter and notches etc.
4. To study about the major and minor losses in pipes.
5. To learn about open channel flow.

Course Content:

List of experiments:
1. To calculate the total energy at different points and plot the graph between total energy vs. distance. (Verification of Bernoulli's equation)
2. To determine the Meta centric height with angle of ship model.
3. To determine the co-efficient of Discharge Cd for Venturimeter
4. To determine the co-efficient of Discharge Cd for Orificemeter.
5. To determine the co-efficient of discharge and the co-efficient of velocity for Orifice.
6. To determine the co-efficient of discharge and the co-efficient of velocity for Mouthpiece.
7. To determine the coefficient of discharge Cd of Rectangular Notch.
8. To determine the coefficient of discharge Cd V Notch - 45^0
9. To determine the coefficient of discharge Cd V Notch - 60^0
10. To determine the friction factor for Darcy-Weisbach equation
11. Experimental determination of critical velocity in pipe.
12. To determine the coefficient of impact for vanes
13. To find the co-efficient of pitot tube
14. To plot velocity profile across the cross section of pipe
15. To determine the Reynold's Number in pipe
16. Calibration of rectangular sharp cornered weir and to study the pressure distribution on the upstream face of the weir.
17. Calibration of rectangular streamlined weir and to study the pressure distribution on the upstream face of the weir.

CourseOutcomes-At the end of the course students will be able to:

CO 1. Perform and verify the principle of Bernoulli's equation.
CO 2. Calibrate and compute the discharge in the flow measuring device.
CO 3. Apply the principle of floating and submerged body.
CO 4. Compute the minor and major losses in pipes.
CO 5. Determine the phenomena of Hydraulic Jump.

SEMESTER-IV

SYLLABUS	(SEMESTER-IV)	Periods/Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL	70	100	03
Subject Code:	CE204TPC05	3	0	0	15	15	30			
Subject:	Engineering Economics									

Course Objectives:

1. To learn about the basics of economics and elements of cost in engineering
2. To study about the value engineering and interest formulae
3. To understand various alternative methods of cost comparison analysis
4. To know about replacement and maintenance involved in engineering components.
5. To understand depreciation of a product.

Course Content:

UNIT 1:Introduction to Economics: Flow in an economy, Law of supply and demand, Concept of Engineering Economics – Engineering efficiency, Economic efficiency, Scope of engineering economics- Element of costs, Marginal cost, Marginal Revenue, Sunk cost, Opportunity cost, Break-even analysis- V ratio, Elementary economic Analysis – Material selection for product Design selection for a product, Process planning.

UNIT 2:Value Engineering: Make or buy decision, Value engineering – Function, aims, Value engineering procedure. Interest formulae and their applications –Time value of money, Single payment compound amount factor, Single payment present worth factor, Equal payment series sinking fund factor, Equal payment series payment Present worth factorequal payment series capital recovery factor-Uniform gradient series annual equivalent factor, Effective interest rate, Examples in all the methods.

UNIT 3: Cash Flow: Methods of comparison of alternatives – present worth method (Revenue dominated cash flow diagram), Future worth method (Revenue dominated cash flow diagram, cost dominated cash flow diagram), Annual equivalent method (Revenue dominated cash flow diagram, cost dominated cash flow diagram), rate of return method, Examples in all the methods.

UNIT 4:Replacement and Maintenance Analysis: Replacement and Maintenance analysis – Types of maintenance, types of replacement problem, determination of economic life of an asset, Replacement of an asset with a new asset – capital recovery with return and concept of challenger and defender, Simple probabilistic model for items which fail completely.

UNIT 5:Depreciation: Depreciation- Introduction, Straight line method of depreciation, declining balance method of depreciation-Sum of the years digits method of depreciation, sinking fund method of depreciation/ Annuity method of depreciation, service output method of depreciation-Evaluation of public alternatives- introduction, Examples, Inflation adjusted decisions – procedure to adjust inflation, Examples on comparison of alternatives and determination of economic life of asset.

TEXT BOOKS:

1. PanneerSelvam, R, ―Engineering Economics‖, Prentice Hall of India Ltd, New Delhi, 2001.
2. Suma Damodaran, ― Managerial economics‖, Oxford university press 2006.
3. Chan S.Park, ―Contemporary Engineering Economics‖, Prentice Hall of India, 2002.

Course Outcome: At the end of the course students shall be able to:

CO 1. Explain the basics of engineering economics and elements of costs.
CO 2. Describe value engineering and can make use of various interest formulae for real life computations
CO 3. Observe and identify the best alternative for cost comparison
CO 4. Determine between replacement and maintenance needed by an asset.
CO 5. Compute the depreciation cost and determine the economic life of a product.

SYLLABUS	(SEMESTER-IV)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL	70	100	03
Subject Code:	CE204TPC06									
Subject:	Concrete Technology	3	0	0	15	15	30			

Course Objectives:

- To learn about various ingredients materials of concrete, like cement aggregates, water, etc
- To understand the role of various Admixtures added to concrete mixes
- To design various grades of concrete as per IS method.
- To understand the various testing methods for fresh & hardened properties of concrete.
- To learn about various special application concretes.

Course Content:

Unit 1: Constituent Material

Cement-Types-Chemical composition and Properties -Tests on cement-IS Specifications- Aggregates-Classification-Mechanical properties and tests as per BIS grading requirements- Water- Quality of water for use in concrete.

Unit 2: Chemical and Mineral Admixtures

Accelerators-Retarders- Plasticisers- Super plasticizers- Water proofers – Mineral Admixtures like Fly Ash, Silica Fume, Ground Granulated Blast Furnace Slag and Metakaolin -Their effects on concrete properties

Unit 3: Proportioning of Concrete Mix

Principles of Mix Proportioning-Properties of concrete related to Mix Design Physical properties of materials required for Mix Design – Design Mix and Nominal Mix-BIS Method of Mix Design – Mix Design Examples

Unit 4: Fresh and Hardened Properties of Concrete:

Workability-Tests for workability of concrete-Slump Test and Compacting factor Test-Segregation and Bleeding-Determination of Compressive and Flexural strength as per BIS – Properties of Hardened Concrete-Determination of Compressive and Flexural Strength-Stress-strain curve for concrete Determination of Young's Modulus.

Unit 5: Special Concretes:

Light weight concretes – High strength concrete – Fibre reinforced concrete – Ferrocement – Ready mix concrete – Slurry infiltrated fibrous concrete (IFCON) - Shotcrete – Polymer concrete – High performance concrete- Geopolymer Concrete.

Text Books:

1. Gupta.B.L., Amit Gupta, "Concrete Technology", Jain Book Agency, 2010.
2. Shetty,M.S, "Concrete Technology", S.Chand and Company Ltd, New Delhi, 2003
3. Santhakumar,A.R; "Concrete Technology" , Oxford University Press, New Delhi, 2007
4. Neville, A.M; "Properties of Concrete", Pitman Publishing Limited, London,1995
5. Gambir, M.L; "Concrete Technology", 3rd Edition, Tata McGraw Hill Publishing Co Ltd, New Delhi, 2007
6. IS10262-1982 Recommended Guidelines for Concrete Mix Design, Bureau of Indian Standards, New Delhi, 1998.

Course Outcomes: At the end of the course students will be able to:

CO 1. Remember & understand properties and role of ingredients like cement, aggregate, admixtures etc. to produce better quality concrete.
CO 2. Understand various classification & role of admixtures on properties of concrete.
CO 3. Apply design concepts (as per IS method) to design various grades of concrete as per requirement.
CO 4. Demonstrate destructive, semi-destructive and non-destructive tests for concrete.
CO 5. Understand about various special application concretes.

SYLLABUS	**(SEMESTER-IV)**	Periods/Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL	70	100	04
Subject Code:	CE204TPC07	3	1	0	15	15	30			
Subject:	Structural Analysis-I									

Course Objectives:

- To study the strain energy principles and their application tobeams and pin joint plane frames
- To learn about analysis of arches &cables.
- To know how to construct the influence line diagrams for determinate beams and its application to estimate the maximum shear force, bending moment at a section and absolute maximum bending moment in the beams.
- To study the construction of influence lines for determinate trusses and three hinged arches and its applications.
- To learn about the static indeterminacy of structures and methods of analysis, application of three moment theorem to beams

Course Content:

UNIT 1: Principle of superposition, virtual work principle, Maxwell reciprocal theorem, deflection of beams using conjugate beam method. Deflection of beams and truss using energy method (Castigliano theorem), Analysis of plane truss using tension coefficient method (determinate).

UNIT 2: Three-hinged Arches: Bending Moment, Shear force, axial force for three-hinged arches, Analysis of Suspension Bridge without stiffening girders.

UNIT 3: Influence Lines: Basic concept of moving load and influence line; influence lines for reactions, Shear force and bending moment for determinate beams; absolute maximum shearing force and bending moment.

UNIT4: Influence lines for three-hinged arches and stresses in simply supported plane determinate trusses.

UNIT 5: Static and kinematic indeterminacy of structure, Method of structural analysis, Analysis of fixed beam, continuous beam using Theorem of three moments, Effect of yielding of supports.

Reference Book:

1. Structural Analysis -DevdasMeenon
2. Fundamental of Structural Analysis - Lee.
3. Elementary structural Analysis - A.K. Jain
4. Advanced Structural Analysis - A. K. Jain
5. Structural Analysis (SI units) - R C Hibbeler
6. Structural Analysis - L S Nagi & R S Jangid

Course Outcomes:At the end of the course the students will be able

CO 1. To apply the concept of conjugate beam and strain energy methods to estimate the deflections of determinate beams and trusses

CO 2. To able to analysis three hinged arches and cables.

CO 3. To construct and use the influence lines for estimation of different force functions in determinate beams

CO 4. To able to draw the ILDs for reactions and internal forces in three hinged arches and determinate trusses and find their values

CO 5. To differentiate the determinate and indeterminate structures and apply the three-moment area theorem for the analysis of continuous beams and fixed beams

SYLLABUS	(SEMESTER-IV)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL	70	100	03
Subject Code:	CE204TPC08				15	15	30			
Subject:	Fluid Mechanics-II	3	0	0						

Course Objectives:
- To introduce and give explanation of fundamentals of turbulent flow in pipe.
- To develop understanding about Boundary layer Analysis.
- To develop understanding about non-uniform flow in open channel.
- To introduce the importance of Compressibility effect in pipe flow.
- To develop understanding about Hydraulic Machines.

Course Content:

UNIT 1: Turbulent flow in pipe: Nature of turbulence, free and wall turbulence, turbulent flow in pipes, equation for velocity distribution over smooth and rough surfaces, Colebrook-White equation, Moody's diagram, Explicit equation for friction factors.

UNIT 2: Boundary layer Analysis: Boundary layer thickness, boundary layer over a flat plate, laminar boundary layer, turbulent boundary layer, and laminar sub layer, Application of momentum equation, local and average friction coefficient. Fluid flow past submerged bodies. Drag and lift, drag on sphere and cylinder Magnus effect.

UNIT 3: Non-uniform flow in open channel: Specific energy, critical flow, analysis of flow over hump and transition, equation of gradually varied flow, hydraulic jump and evaluation of its elements in rectangular channel.

UNIT 4: Compressibility effect in pipe flow: Transmission of pressure waves in rigid and elastic pipes, water hammer Dimensional analysis and Hydraulic similitude. Dimensional analysis, Buckingham's theorem, important dimensionless numbers and their significances, geometric, kinematics and dynamic similarity, model study.

UNIT 5: Hydraulic Machines: Turbines: Classification of turbines, draft tube, specific speed, unit quantities, and characteristics curves of turbines, and governing of turbine. Pump: Introduction, Centrifugal pumps, efficiencies, specific speed, cavitations, slip, percentage slip.

Text Books:

1. Fluid Mechanics and Machines – Dr. A.K. Jain (Khanna Publications)
2. Fluid Mechanics and Machines – Dr. R.K. Bansal (Laxmi Publications)
3. Fluid Mechanics – Dr. P.N. Modi (Standard Book House)
4. Mechanics of Fluid – Irving H. Shames (McGraw Hill)
5. Introduction to Fluid Mechanics – James A. Fay (Prentice Hall India)

Reference Books:

1. Fluid Machines – Dr.JagdishLal (Metropolitan Book Company Private Ltd.)
2. Fluid Machines – John P. Douglas (Pearson Publication)

Course Outcomes: At the end of the course students will be able to

CO1. Define Turbulent flow in pipe and velocity equations for smooth and rough boundary of pipe.

CO2. Describe the Boundary layer theory and drag and lift.

CO3. Explain the concept of non-uniform flow in open channel.

CO4. Explain the concept of Compressibility effect in pipe flow

CO5. Describe the concept of Hydraulic Machines.

SYLLABUS	(SEMESTER-IV)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
Subject Code:	CE204THS02	L	T	P	CT-I	CT-II	TOTAL	70	100	03
Subject:	Effective Technical Communication	3	0	0	15	15	30			

Course Objectives:

Effective Technical communication is critical in today's world. Most problems in an organization arise as a result of poor communication. Effective communication ensures a smooth flow of ideas, facts, decisions, and advice. This way, employees eliminate hindrances in achieving the organization's target.

Course Content:

Unit-1 Fundamentals of Communication Technical Communication: features: Distinction between General and Technical communication; Language as a tool of communication; Levels of communication: Interpersonal, Organizational, Mass communications; the flow of Communication: Downward, Upward, Lateral of Horizontal (Peer group): Importance of technical communication; Barriers to Communication.

Unit-2 Constituents of Technical Written Communication Words and Phrases: Word formation. Synonyms and Antonyms; Homophones; Select vocabulary of about 500-1000 New words; Correct Usage: all Parts of Speech; Modals; Concord; Articles; Infinitives; Requisites of Sentence Construction: Paragraph Development: Techniques and Methods- Inductive, Deductive, Spatial, Linear, Chronological etc; The Art of Condensation-various steps.

Unit-3 Business Communication Principles, Sales & Credit letters; Claim and Adjustment Letters; Job application and Resumes. Reports: Types; Significance; Structure, Style & Writing of Reports. Technical Proposal; Parts; Types; Writing of Proposal; Significance. Negotiation & Business Presentation skills.

Unit-4 Presentation Strategies and Listening Skills. Defining Purpose; Audience & Local; Organizing Contents; Preparing Outline; Audio-visual Aids; Nuances of Delivery; Body Language; Dimensions of Speech: Syllable; Accent; Pitch; Rhythm; Intonation; Paralinguistic features of voice; Listening Skills: Active Listening, Passive Listening. methods for improving Listening Skills.

Unit-5 Value-Based Text Readings following essays form the suggested text book with emphasis on Mechanics of writing. (i) Humanistic and Scientific Approaches to Human Activity by Moody E. Prior (ii) The Language of Literature and Science by A. Huxley (iii) Man and Nature by J.Bronowski (iv) The Social Function of Literature by Ian Watt (v) Science and Survival by Barry Commoner (vi) The Mother of the Sciences by A.J.Bahm (vii) The Effect of Scientific Temper on Man by Bertrand Russell.

Text Book:

1) Improve Your Writing ed. V.N.Arora and Laxmi Chandra, Oxford Univ. Press, 2001, New Delhi..
2) Technical Communication: A Practical Approach: Madhu Rani and SeemaVerma- Acme Learning, New Delhi-2011
3) Technical Communication- Principles and Practices by Meenakshi Raman &Sangeeta Sharma, Oxford Univ. Press,2007, New Delhi.

Reference Books:

1) Communication Skills for Engineers and Scientists, Sangeeta Sharma et.al. PHI Learning Pvt.Ltd,2011, New Delhi.
2) Business Correspondence and Report Writing by Prof.R.C.Sharma& Krishna Mohan, Tata McGraw Hill & Co.Ltd.,2001, New Delhi.
3) Word Power Made Easy by Norman Lewis, W.R.Goyal Pub. &Distributors, 2009,Delhi.
4) Developing Communication Skills by Krishna Mohan, MecraBannerji- Macmillan India Ltd. 1990, Delhi.
5) Manual of Practical Communication by L.U.B.Pandey: A.I.T.B.S. Publications India Ltd.; Krishan Nagar, 2013, Delhi.
6) English Grammar and Usage by R.P.Sinha,

Course Outcomes:

At the end of the semester, the student shall be able to

CO1. Differentiate and apply general as well as technical Communication at various levels.

CO2. Adopt new vocabulary of 1000 new words and constituents of Technical written communication and improve the vocabulary and Accent.

CO3. Apply business communication principles and presentation skills.

CO4. Develop listening skills and apply the methods of improving listening skills.

CO5. Apply the mechanics of writing from value based text readings**.**

SYLLABUS	(SEMESTER-IV)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
Subject Code:	CE204TMC02	3	0	0	-	-	-	-	-	00
Subject:	Management (Organizational Behaviour)									

Course Learning Objectives: The objective of this Course is

• To improve students understanding of human behavior in organization and the ability to lead people to achieve more effectively toward increased organizational performance.

• To understand individual behavior in organizations, including diversity, attitudes, job satisfaction, emotions, moods, personality, values, perception, decision making, and motivational theories.

• To understand group behavior in organizations, including communication, leadership, power and politics, conflict, and negotiations.

• To understand the organizational system, including organizational structures, culture, human resources, and change.

Course Content:

UNIT 1:FOCUS AND PURPOSE: Definition, need and importance of organizational behaviour – Nature and scope – Frame work – Organizational behaviour models.

UNIT 2: INDIVIDUAL BEHAVIOUR: Personality – types – Factors influencing personality – Theories – Learning – Types of learners – The learning process – Learning theories – Organizational behaviour modification. Misbehaviour – Types – Management Intervention. Emotions- Emotional Labour – Emotional Intelligence – Theories. Attitudes – Characteristics – Components – Formation – Measurement- Values. Perceptions – Importance – Factors influencing perception – Interpersonal perception- Impression Management. Motivation – importance – Types – Effects on work behavior.

UNIT 3: GROUP BEHAVIOUR: Organization structure – Formation – Groups in organizations – Influence – Group dynamics – Emergence of informal leaders and working norms – Group decision making techniques –Team building - Interpersonal relations – Communication – Control.

UNIT 4: LEADERSHIP AND POWER: Meaning – Importance – Leadership styles – Theories – Leaders Vs Managers – Sources of power – Power centers – Power and Politics.

UNIT 5: DYNAMICS OF ORGANIZATIONAL BEHAVIOUR: Organizational culture and climate – Factors affecting organizational climate – Importance. Job satisfaction – Determinants – Measurements – Influence on behavior. Organizational change – Importance – Stability Vs Change – Proactive Vs Reaction change – the change process – Resistance to change – Managing change. Stress – Work Stressors – Prevention and Management of stress – Balancing work and Life. Organizational development – Characteristics – objectives –. Organizational effectiveness.

TEXT BOOKS

1. Stephen P. Robins, Organisational Behavior, PHI Learning / Pearson Education, 11th edition, 2008.
2. Fred Luthans, Organisational Behavior, McGraw Hill, 11th Edition, 2001.

Course Outcomes:

At the end of the course the studentsshall be able

CO 1. To Compare and contrast theories of organizational behavior.
CO 2. To analyze management issues as related to organizational behavior.
CO 3. To evaluate ethical issues as related to organizational behaviour
CO 4. To examine challenges of effective organizational communication
CO 5. To examine the differences and similarities between leadership, power, and management.
CO 6. To assess the impact of culture on organizational behavior

SYLLABUS	(SEMESTER-IV)	Periods/ Week			Internal Assessment (IA)	ESE	Grand Total	Credits
		L	T	P	IA			
Subject Code:	CE204PES06	0	0	2	30	20	50	01
Subject:	Computer Aided Civil Engineering Drawing							

Course objectives:

- To introduce the fundamentals of Civil Engineering drawing.
- To practice the understanding of the principles of planning.
- To develop capability to understand and learn drafting of building drawings.
- To impart knowledge on drafting software such as AutoCAD

Course Content:

List of Experiments :(at least 10 sheets / plates are mandatory)

1. Drawing of symbols used in building drawings.
2. Drawing of Wooden and Steel, doors, windows and ventilators (Panelled/Glazed).
3. Drawing of different masonry bonds and masonry walls
4. Drawing of different Foundation
5. Drawing of different stair cases (RC/Steel).
6. Drawing of Industrial buildings with trusses
7. Drawing of Plan, elevation and section of Residential Buildings with tiled/flat roof.
8. Drawing of Preparation of site plan and service plans as per building rules for single and two storied buildings.
9. Drawing of Plan, elevation and section of public building like school, college etc.
10. Drawing of septic tanks and soak pit.

Text Books / References:

1. Shah, M.G., Kale, C. M. and Patki, S.Y. Building Drawing with An Integrated Approach to Built Environment, Tata McGraw Hill Publishing Company Limited, New Delhi.
2. AutoCAD Essentials, Autodesk official Press, John Wiley & Sons, USA.
3. National Building Code of India.
4. Building drawing with an integrated approach to built environment by M. Shah, C. Kale, S. Patki, Tata McGraw Hill Education; 4th edition.
5. Building Planning and Drawing by y M.V. Chitawadagi S.S. Bhavikatti, Dreamtech Press.
6. Civil Engineering Drawing & House Planning: A Text Book by B. P. Verma, khanna publishers.
7. Civil Engineering Drawing by byRangwala, Charotar Publishing House Pvt. Ltd.
8. Building Planning and Drawing by Dr. N. Kumara Swamy, A. Kameswara Rao, Charotar Publishing House Pvt. Ltd.
9. N Krishna Raju, Structural Design and Drawing, Second Edition, Universities Press (India), Private Limited, Hyderabad.

Course Outcomes: On the completion of this course, the student will be able:

CO 1. To plan areas according to the functional requirements and develop line sketches and working drawings of RCC residential buildings for the given area and requirements.
CO 2. To prepare the plan, section and elevation of a RCC building from given line sketches
CO 3. To plan and draw the elevations and sections of industrial buildings with steel trusses and the joint connections.
CO 4. To develop site plan of a given building using building bye laws/regulations.
CO 5. To make use of Auto CAD software for preparation of plan, elevation and section of a structure/component/element.

SYLLABUS	(SEMESTER-IV)	Periods/ Week			Internal Assessment (IA)	ESE	Grand Total	Credits
Subject Code:	CE204PPC03	L	T	P	IA	20	50	01
Subject:	Material Testing Lab	0	0	2	30			

Course Objectives:

- To Remember & understand various Properties of Cement &to learn testing methodology of each properties of cement.
- To learn to perform various experiments related to properties of Aggregates.
- To be able to examine the various properties of prefabricated bricks.
- To learn to perform various Destructive & non –destructive tests on concrete.

Course Content:

List of experiments

Testing of cement:

1. Normal Consistency, Fineness of Cement, Setting times of Cement
2. Specific Gravity of Cement
3. Soundness of Cement
4. Compressive strength of cement

Testing of aggregate:

1. Fineness modulus of Fine and Coarse aggregate
2. Bulk density of aggregate
3. Specific Gravity and Water Absorption of Aggregate
4. Bulking of Sand

Testing of bricks

1. Compressive strength, Water Absorption &Efflorescence of Bricks

Testing of concrete:

1. Workability of Concrete
2. Compressive strength
3. Modulus of Elasticity
4. Tensile Strength of Concrete
5. NDT Test of Concrete

Text Books / References:

1. Building Materials – S.K. Duggal (New Age Publication)
2. Building Materials – S. C. Rangwala (Charotar Publication)
3. Building Construction by S.G. Rangwala, Charter Publishing House, Anand, India

Course Outcomes: At the end of the course students will be able to:

CO 1. Conduct various tests on Cement,

CO 2. Carryout testing of Aggregates and Bricks.

CO 3. Test Concrete for grade and workability.

CO 4. Evaluate Modulus of Elasticity of concrete and also its mechanical properties

CO 5. Conduct Non – Destructive testing of concrete.

SYLLABUS	(SEMESTER-IV)	Periods/ Week			Internal Assessment (IA)	ESE	Grand Total	Credits
		L	T	P	IA			
Subject Code:	CE204PHS01	0	0	2	30	20	50	01
Subject:	Effective Technical Communication Lab							

Course Learning Objectives:

Interactive and Communicative Practical with emphasis on Oral Presentation/Spoken Communication based on International Phonetic Alphabets (I.P.A.)

Course Content:

List of Experiments:

1. Group Discussion: Practical based on Accurate and Current Grammatical Patterns.
2. Conversational Skills for Interviews under suitable Professional Communication Lab conditions with emphasis on Kinesics.
3. Communication Skills for Seminars/Conferences/Workshops with emphasis on Paralinguistics/ Kinesics.
4. Presentation Skills for Technical Paper/Project Reports/ Professional Reports based on proper Stress and Intonation Mechanics.
5. Official/Public Speaking based on suitable Rhythmic Patterns.
6. Theme- Presentation/ Key-Note Presentation based on correct argumentation methodologies.
7. Individual Speech Delivery/Conferences with skills to defend Interjections/Quizzes.
8. Argumentative Skills/Role Play Presentation with Stress and Intonation.
9. Comprehension Skills based on Reading and Listening Practicals on a model Audio-Visual Usage.

Reference Books:

1. Bansal R.K. & Harrison: Phonetics in English, Orient Longman, New Delhi.
2. Sethi&Dhamija: A Course in Phonetics and Spoken English, Prentice Hall, New Delhi.
3. L.U.B.Pandey&R.P.Singh, A Manual of Practical Communication, A.I.T.B.S. Pub. India Ltd. Krishan Nagar, Delhi.
4. Joans Daniel, English Pronouncing Dictionary, Cambridge Univ. Press.

Course Outcomes: On completion of the course, the students would be able to:

CO 1. Improve interpersonal communication
CO 2. Overcome stage fright and enhance confidence
CO 3. Participate in GDs
CO 4. Master presentation Skills and Interview Skills
CO 5. Learn and practice Listening, Reading, Writing and Speaking Skills