



DEPARTMENT OF TECHNOLOGY

SECOND YEAR B.TECH

Civil Engineering

Scheme of Teaching and Examination Semester – III

w.e.f. Academic Year 2021-22

Subject Code	Subject	Teaching Scheme (Hours / Week)				Examination Scheme (Marks)					
		L	T	P	Credits	Theory			Practical		
						Scheme	Max. marks	Min. Passing #	Scheme	Max. marks	Min. Passing
MA 211	Engineering Mathematics-III	04	01	-	05	CIE	30	40	IOE	50	20
						SEE	70		-----	-----	-----
CE 211	Surveying	04	-	-	04	CIE	30	40	-----	-----	-----
						SEE	70		-----	-----	-----
CE 212	Strength of Materials	03	01	-	04	CIE	30	40	-----	-----	-----
						SEE	70		-----	-----	-----
*CE 213	Building Construction	03	-	-	03	CIE	30	40	-----	-----	-----
						SEE	70		-----	-----	-----
CE 214	Fluid Mechanics-I	03	01	-	04	CIE	30	40	-----	-----	-----
						SEE	70		-----	-----	-----
CEL 215	Lab-I Fluid Mechanics-I	-	-	02	01	-----	-----	-----	IPE	50	20
CEL 216	Lab-II Strength of Materials	-	-	02	01	-----	-----	-----	EPE	50	20
CEL 217	Lab-III Building Construction	-	-	02	01	-----	-----	-----	EPE	50	20
CEL 218	Lab-IV Surveying	-	-	04	02				IPE	50	20
									EPE	50	20
Total		17	03	10	25	-----	500	-----	-----	300	-----
Audit Courses											
HS 211	Environmental Studies	2	-	-	-----	Institute/ Departmental Level	Project* Theory*	30 70	40	-----	-----
HS 212	Introduction to Performing Arts	2	-	-	-----	Institute/ Departmental Level	100	20	-----	-----	-----

Total contact hours per week: $30+2+2=34$

Total Credits: 25

Note:

#: Minimum 40% marks required in CIE to become eligible for SEE.

• Tutorials and practical shall be conducted in batches with batch strength not exceeding 18 students.

* Theory paper will be of 4 hours.

CIE – Continuous Internal Evaluation,

IPE – Internal Practical Evaluation,

IOE – Internal Oral Evaluation,

SEE – Semester End Examination,

EPE – External Practical Examination,

EOE – External Oral Examination



DEPARTMENT OF TECHNOLOGY
SECOND YEAR B.TECH
Civil Engineering

Scheme of Teaching and Examination Semester – IV
w.e.f. Academic Year 2021-22

Subject Code	Subject	Teaching Scheme (Hours / Week)				Examination Scheme (Marks)					
		L	T	P	Credits	Theory			Practical		
						Scheme	Max. marks	Min. Passing \$	Scheme	Max. marks	Min. Passing
CE 221	Theory of Structures-I	04	01	-	05	CIE	30	40	-----	-----	-----
						SEE	70		-----	-----	-----
CE 222	Concrete Technology	04	-	-	04	CIE	30	40	-----	-----	-----
						SEE	70		-----	-----	-----
CE 223	Fluid Mechanics- II	03	-	-	03	CIE	30	40	-----	-----	-----
						SEE	70		-----	-----	-----
* CE 224	Building Planning and Drawing	04	-	-	04	CIE	30	40	-----	-----	-----
						SEE	70		-----	-----	-----
CE 225	Engineering Geology	03	-	-	03	CIE	30	40	-----	-----	-----
						SEE	70		-----	-----	-----
CEL 226	Laboratory- I Concrete Technology	-	-	04	02	-----	-----	-----	IPE	50	20
									EPE	50	20
CEL 227	Lab-II Engineering Geology	-	-	02	01	-----	-----	-----	IPE	50	20
CEL 228	Lab-III Fluid Mechanics-II	-	-	02	01	-----	-----	-----	EPE	50	20
CEL 229	Lab-IV Building Planning and Drawing	-	-	04	02	-----	-----	-----	IPE	50	20
									EPE	50	20
	Total	18	01	12	25	-----	500	-----	-----	300	-----
Audit Courses											
HS 221	Environmental Studies	2	-	-	-----	Institute/ Departmental Level	Project* Theory*	---	-----	---	30
HS 222	Soft Skills Development	2	-	-	-----	Institute/ Departmental Level	100	---	-----	---	40

Total Credits: 25

Total Contact Hours/Week: 31+2+2=35

Note:

\$: In theory student should appear for the CIE (Mid Semester Exam) submit the assignment and must secure 40% marks in SEE

- Tutorials and practical shall be conducted in batches with batch strength not exceeding 18 students.

*Theory paper will be 4 hours.

CIE – Continuous Internal Evaluation, SEE – Semester End Examination,
IPE – Internal Practical Evaluation, EPE–External Practical Examination,
IOE– Internal Oral Evaluation, EOE–External Oral Examination

Note: After semester IV, during vacation period, students will undergo Internship I for minimum 4 weeks in a reputed industry from standpoint Civil Engineering principles. The students will submit a report of the training. This particular activity is equivalent to one credit and it carries 50 marks as an Internal Oral Evaluation (IOE) which is included in Semester V. For submission of the activity report, all the students will follow one specific format recommended by the Program Advisory Board.

Class, Part & Semester	Second Year B. Tech (Civil Engineering), Part II & Sem III			
<i>Course Title</i>	Engineering Mathematics-III			<i>Course Code:</i> : MA 211
<i>Teaching Scheme (Hours)</i>	Lecture :	4 Hrs/week		<i>Total Credits</i> : 05
	Tutorial :	1 Hrs/week		
<i>Evaluation Scheme (Marks)</i>	CIE=30 (20+10)	SEE = 70	Grand Total=100	<i>Duration of SEE</i> : 3 hrs
<i>Revision:</i>	Second			<i>Month</i> : June 2021
<i>Pre-requisites (if any)</i>	BS-11A1, BS-12A1, BS-11B1, BS-12B1			
<i>Course Domain</i>	Basic Sciences			
Course Rationale:				
This course offers a mathematical understanding for engineering applications. This course produce graduates with mathematical knowledge, computational skills and the ability to deploy these skills effectively in the solution of problems, principally in the area of engineering.				
Course Objectives: The Course teacher will			Course Outcomes: Students will be able to	
1.	To describe solution of LDE and its applications in civil engineering		1.	Solve Linear Differential Equations and Apply them to realistic problems.
2.	To introduce Fourier series		2.	Understand Application of Fourier series
3.	To be familiarize with partial differential equations and its applications		3.	Solve Partial Differential Equations for solving problems in civil engineering fields and Understand the applications of second order PDEs.
4.	To analyze engineering problems based on probability and to introduce vector calculus		4.	To solve engineering problems using Probability and Apply knowledge of Vector Calculus to solve engineering problems.
Curriculum Content				Hours
Unit I Linear Differential Equations				09
Linear Differential Equations with constant coefficients, Homogenous Linear differential equations, Applications of Linear Differential Equations with constant coefficients to civil engineering problems (Cantilever, Strut and beam).				
Unit II Fourier Series				08
Dirichlet's conditions, Full range Fourier series, Half range Fourier series, Harmonic analysis.				
Unit: III Partial differential equations				09
First order partial differential equations, solutions of first order linear and non-linear PDEs- Four standard forms of partial differential equations of first order.				
Unit IV Application of Partial differential Equations				09
Classification of PDE, Solution of Wave Equation, One dimensional heat equation and two				

dimensional Laplace equation by the method of separation of variables, use of Fourier series.	
<p>Unit V Probability</p> <p>Random variable, Probability mass function and probability density function, Binomial, Poisson and Normal distributions.</p>	08
<p>Unit VI Vector Calculus</p> <p>Vector Differentiation: 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.</p> <p>Vector Integration: The line integral, Surface integral, volume integral, Gauss's Divergence theorem, Stoke's theorem, Green's theorem (Without proof).</p>	09
<p>Suggested list of Tutorials and Assignments:</p> <ol style="list-style-type: none"> 1. To find solution of LDE with constant coefficients 2. Applications of LDE 3. Examples on Fourier series 4. Examples on Partial Differential Equations 5. Applications Of PDE 6. Examples on Probability 7. Vector differentiation 8. Vector Integration <p>General Instructions:</p> <ol style="list-style-type: none"> 1. Batch wise tutorials are to be conducted. The number of students per batch should be as per the practical batches. 2. Students must be encouraged to solve engineering mathematics problems using different software's in tutorial class only. 3. Each Student has to write at least 6 assignments on entire syllabus. 	

<i>Suggested Text Books:</i>	
1.	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi.
2.	N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications.
3.	Veerarajan T., Engineering Mathematics, Tata McGraw-Hill, New Delhi.
<i>Suggested Reference Books:</i>	
1.	Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons.
2.	B. V. Ramana, "Higher Engineering Mathematics", McGraw Hill, New Delhi,
3.	Merle C. Potter, "Advanced Engineering Mathematics", OXFORD University Press, 3rd Edition
4.	C.R. Wylie, "Advanced Engineering Mathematics", McGraw Hill Publication, New Delhi.
5.	Shanti Narayan, "Differential Calculus" S. Chand and company, New Delhi.
6.	H. K. Das, "Advanced Engineering Mathematics", S. Chand Publication

Class & Semester	:	Second Year B. Tech (Civil Engineering), Part II & Sem III				
Course Title	:	Surveying		Course Code:	: CE211	
Teaching Scheme (Hours)	:	Lecture :	4 Hrs/week		Total Credits	: 04
	:	Tutorial :	- Hrs/week			
Evaluation Scheme (Marks)	:	CIE=30 (20+10)	SEE = 70	Grand Total= 100	Duration of SEE	: 3 hrs
Revision:	:	Second			Month	: June 2021
Pre-requisites (if any)	:	ES-12A2 , ES-11B2, ES-12A5, ES-11B5				
Course Domain	:	Core				
Course Rationale: <i>Surveying is basic requirement of all civil engineering projects. Therefore this course focuses on various basic methods and advanced method of Surveying.</i>						
Course Objectives: The Course teacher will			Course Outcomes: Students will be able to			
1.	To develop the ability of applying knowledge of mathematics, science, and engineering to understand the measurement techniques and equipment used in land surveying.	1.	Use various leveling instruments for land survey.			
2.	To study the instruments, principle, methods and significance of the plane table surveying in plan making	2.	Apply various surveying technique for the preparation of map.			
3.	To understand the use of Theodolite Survey, Tacheometric Survey for linear and angular measurements.	3.	Use 'Theodolite' for linear and angular measurements required for Traverse Survey, Tacheometric Survey and Road Survey.			
4.	To learn advanced surveying using modern instrument such as Total Station.	4.	Apply surveying technique using advanced instrument such as Total Station for Engineering Problem.			
Curriculum Content						Hours
Unit I						
Levelling						
Construction and Permanent adjustments of Dumpy Level, Auto Level, Sensitivity of Bubble Tube, Curvature and Refraction, Reciprocal Levelling, Errors in Levelling, Precise Levelling, Study of Precise level, classification based on precision limits, Field Procedure, Contouring, Characteristics of Contours, Methods of Plotting Contours, Uses of Contour Maps, Applications of levelling						9
Unit II						
Plane Table Survey						9

<p>Principle, Plane Table Accessories, Methods of Plane Table Survey, Errors, Advantages and disadvantages, Computation of area using co-ordinates, Mid-ordinate Rule, Average Ordinate rule, Trapezoidal, Simpson's Rule, Area from Plan, Computation of volume by trapezoidal and prismatic formula, volume from spot levels, volume from contour plan</p>	
<p>Unit III Theodolite Theodolite, Types of Theodolite, Construction, Adjustments and uses, Methods of horizontal and vertical angle measurement, Use of Electronic Theodolite, Theodolite Traversing, Methods for Linear and Angular Measurement, Locating Details, Compatibility of Linear and Angular Measurement, Computation of Bearing, Latitudes and Departures, Consecutive and Independent Co-ordinate, Traverse Computations and adjustment, Omitted Measurement, Trigonometric Levelling</p>	9
<p>Unit IV Curves Horizontal curves: Elements, Setting out of simple circular curve by linear and angular methods. Elements of compound, reverse and transition curves, vertical curve</p>	9
<p>Unit V Tacheometry Tacheometry: Significance & Systems, Principle, constants. Basic Formulae and Field, Work Stadia method, Auto reduction Tacheometer, Tangential system, Subtense Bar system</p>	7
<p>Unit VI Modern Surveying Electronic Distance Measurement (EDM), Importance, Principles of EDMs, Classification of EDM's based on carrier waves used, Types of E.D.M., Total Station, Study and use of Total Station, Concept of Utility mapping, Lidar, GPR, Introduction to drone, minor instruments.</p>	9
<p>Suggested list of Tutorials and Assignments: Assignment will be based on each unit.</p>	
<p>General Instructions: 10 marks will be given based on Assignment as a part of CIE.</p>	
<p>Suggested Text Books:</p>	
1.	A.M. Chandra, "Plane Surveying", New Age Publication
2.	A.M. Chandra, "Higher Surveying", New Age Publication
3.	T.P. Kanetkar and S.V. Kulkarni, "Surveying and Leveling Vol.1 & 2, Vidhyarthi Griha Prakashan,Pune
<p>Suggested Reference Books:</p>	
1.	K.R. Arora, "Surveying", Vol. I ,II, III ,Standard Book House

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2.	C.D. Ghilani, "Elementary Surveying- An Introduction to Geomatics", Pearson Publication
3.	W. Schofield, "Engineering Surveying", Taylor and Francis Group
4.	B.C. Punmia, "Surveying", Vol.I, II, III, Laxmi Publication.

Class, Part & Semester	:	Second Year B. Tech (Civil Engineering), Part II & Sem III			
Course Title	:	Strength of Materials			Course Code: : CE212
Teaching Scheme (Hours)	:	Lecture :	3 hrs/week		Total Credits : 04
		Tutorial :	01 hour/week		
Evaluation Scheme (Marks)	:	CIE=30 (20+10)	SEE = 70	Grand Total=100	Duration of SEE : 3 hrs
Revision:	:	Second			Month : June 2021
Pre-requisites (if any)	:	BS-11A2, BS-12B2, ES-11A2, ES-12B2			
Course Domain	:	Core			
Course Rationale:					
Strength of Materials forms a core subject, taught to all students of the non-circuit disciplines of engineering. The study of this course is aimed at developing a thorough practical understanding of the basic material behaviour through simple experiments on different materials.					
Course Objectives: The Course teacher will			Course Outcomes: Students will be able to		
1.	To explain the important engineering properties of materials and behaviour.	1.	Interpret various engineering materials on basis of their properties and behaviour to loading.		
2.	To explain the Shear force and Bending Moments for a beam.	2.	Construct Shear force and Bending Moments diagrams for a beam.		
3.	To explain the Bending and Shear stress for a beam and behaviour of materials subjected to pure torsion.	3.	To Find the Bending, Shear stress Distribution and Torsion for a beam.		
4.	To make aware of basic concepts of Principal Stress and Columns.	4.	To solve problem related to Principal Stress and Columns.		
Curriculum Content					Hours
Unit I Stress and Strain Engineering properties of different materials, simple stress and strain, and Hooke's law, elastic behaviour of the body under external actions, simple and complementary shear stresses, temperature stresses, elastic constants, Relation among elastic constants, Stress strain behaviour of mild and tor steel. Simple Sections, composite sections, uni-axial loading, biaxial and triaxial loading.					07
Unit II SFD and BMD of Statically Determinate Beams Shear force diagrams and bending moment diagrams for concentrated loads, couples, uniformly distributed loading and uniformly varying loading in Simply supported beams, cantilever beams, overhanging beams.					06
Unit III Bending Stress in Beams					06

Concept of pure bending, Derivation of flexural formula, Section modulus, Moment of resistance, Lever arm, Simple design Problems for rectangular and flanged Sections.	
Unit IV Shear Stress in Beams Derivation of shear stress formula, Stress distribution diagrams for Standard shapes, Relation between maximum and average shear stresses for rectangular, triangular, diamond and circular sections, simple design problems for composite shapes.	06
Unit V Analysis of Circular Shafts Subjected to Torsion Solid and Hollow circular shafts, Torsion formula, Polar modulus of Shaft, Power Transmitted through Shaft, Comparison of shafts.	06
Unit VI a) Principal stresses and Principal strains: Normal and Shear stresses on any oblique plane, Concept of principal planes and principal stresses; Derivation of principal stresses, maximum shear stresses; Orientation of principal planes, analytical and graphical methods (Mohr's circle of stress 2-D). b. Axially loaded Columns: Concept of stability, critical load and buckling; Derivation of Euler's formula for buckling load with hinged ends; Concept of equivalent length for various end conditions Euler's formula, Rankine's formula, Safe load on column; Limitations of Euler's formula.	08
Suggested list of Tutorials and Assignments:	
<ol style="list-style-type: none"> 1. Numericals on Stress and Strain. 2. Numericals on SFD and BMD. 3. Numericals on Bending Stress in Beams. 4. Numericals on Shear Stress in Beams. 5. Numericals on Torsion . 6. Numericals on Principal stresses and Principal strains and Columns . 	
Suggested Text Books:	
1.	Mechanics of Materials Vol I and II - Punmia, Jain, Laxmi Publications
2.	Strength of Materials - S Ramamrutham, DhanapatRai Publications.
3.	Strength of Materials - Bhavikatti S.S., New Age Publications.
4.	Strength of Materials - R.K.Bansal., Laxmi Publications.
5.	Structural Analysis - Bhavikatti S.S, Vikas Publications house New Delhi.
Suggested Reference Books:	
1.	Strength of Materiall - F. L. Singer and Pytel, Harper and Row publication.

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2.	Introduction to Mechanics of Solids - J.B. Popov, Prentice – Hall publication.
3.	Mechanics of Materials - Gere and Timoshenko, CBS publishers.
4.	Mechanics of Materials - R.C. Hibbler, Pearson Education.

Class, Part & Semester	Second Year B. Tech (Civil Engineering), Part II & Sem III			
Course Title	Building Construction		Course Code:	CE213
Teaching Scheme (Hours)	Lecture :	03Hrs/week		Total Credits
	Tutorial :	00Hrs/week		
Evaluation Scheme (Marks)	CIE=30 (20+10)	SEE = 70	Grand Total=100	Duration of SEE
Revision:	Second			Month
Pre-requisites (if any)	ES-12A2, ES-11B2			
Course Domain	Core			
Course Rationale: The course basically focuses on fundamentals of building materials. Engineering properties of building materials are discussed in detail. Different building components their significance and functions are explained in the course. Design of stairs is taught in this course.				
Course Objectives: The Course teacher will			Course Outcomes: Students will be able to	
1.	Necessity and scope of Civil Engineering and construction technology, Engineering properties of materials like brick, steel, timber, cement etc. and Types of foundation, basic components, parts of building and their requirements		1.	Develop the ability and apply the techniques of construction in the design of buildings and Explain Types of foundation, basic component parts of building and their requirements.
2.	Illustrate the Details of brick bond, masonry work etc.		2.	Develop awareness of low cost housing & green building and new construction techniques.
3.	Categorize Arches and Explain design consideration with technical terms and Explain windows, doors, stairs, lintels based on material used.		3.	Illustrate the Details of brick bond, masonry work, and properties of cement and Categorize Arches and Explain design consideration with technical terms.
4.	Illustrate roof and roof coverings also flooring materials, types of materials used.		4.	Explain windows, doors, stairs, lintel as well as roof and roof coverings also flooring materials.
Curriculum Content				Hours
Unit I Engineering properties of following materials: Stones – Requirements of good building stones, Dressing of stones, uses of building stones. Bricks – Manufacturing process , Types and Engineering Properties. Aggregates - Fine Aggregates and coarse aggregates - Origin, types, particle size and shape, mechanical and physical properties, grading, sieve analysis.				7

<p>Timber – Natural wood , sectioning detail for door , window, Artificial wood and their use in Civil Engineering.</p> <p>Steel – Manufacturing of steel with reference to carbon content, Standard sections, steel as reinforcement. High Yield Strength Steel and high tensile steel, uses of steel in Building Construction. Anti-corrosive treatments.</p> <p>Cement- Manufacturing of cement, Ordinary Portland, rapid hardening and low heat cements, main properties.</p> <p>Tiles -Introduction to Vitrified, Natural Stone, Paving Blocks etc.</p>	
<p>Unit II</p> <p>Basic requirements of a building as a whole: strength and stability, Dimensional stability, comfort and convenience, damp prevention, water-proofing techniques, heat insulation, day lighting and ventilation. Sound insulation and anti-termite treatment.</p> <p>Building components and their basic requirements : Foundations, plinth, walls and RCC components in building, floors, doors and windows, sills, lintels and weather sheds, roofs, steps and stairs, utility fixtures.</p> <p>Formwork for basic RCC elements: Ideal Requirements and types. Method of fixing.</p> <p>Foundations: Stepped, isolated, combined, strip, raft, strap or cantilever, piles. Suitability of each type.</p>	<p>6</p>
<p>Unit III</p> <p>Plain cement concrete: Properties, Grades and their uses.</p> <p>Stone masonry : Random Rubble, Uncoursed Rubble, Coursed Rubble and Ashlar Masonry</p> <p>Brickwork and Brick Bonds : English, Flemish, Principles Observed During construction</p>	<p>6</p>
<p>Unit IV</p> <p>Composite masonry: Various types of partition walls, brick, aluminium and timber.</p> <p>Solid concrete blocks, hollow concrete blocks and light weight blocks (Siporex), soil stabilized blocks, Fly Ash Blocks. Environment benefits</p>	<p>6</p>
<p>Unit V</p> <p>Arches: Arches and their stability consideration, technical terms in arches, types of arches, methods of construction.</p> <p>Lintel: Necessity, Materials: wood, steel, R.C.C.</p> <p>Doors: Classification, T.W. Panelled Door, Flush Door, Aluminium Glazed Doors, Steel Doors, fixtures and fastening.</p>	<p>8</p>

<p>Windows : Classification, T.W. Glazed Windows, Aluminium Glazed Windows, Steel Windows, fixtures and fastening.</p> <p>Stairs: Technical terms, requirements of a good stair, uses, types, materials for Construction. Design of stairs (Dog Legged and Open Well)</p>	
<p>Unit VI</p> <p>Roofs and Roof coverings: Terms used. Roof and their selection, pitched roofs and their types, Timber Trusses (King Post and Queen Post), Steel Trusses types and their suitability, roof coverings and their selection.</p> <p>Selections of floorings: flooring (Natural and Artificial Material), Concrete Flooring (Tremix Flooring)</p>	7
<p>Suggested list of Assignments:</p> <ol style="list-style-type: none"> 1. Engineering properties – Stones, Bricks, Aggregates, steel. 2. Engineering properties – Timber , cement 3. Building components and their sketches. 4. Form work and their sketches 5. Different foundations and their sketches 6. Different types of stone masonry and their sketches 7. Different types of Brick masonry and their sketches 8. Problems on Doors 9. Problems on windows 10. Problems on stairs design. <p>General Instructions: Site Visits along with curriculum to expose students to various aspects in relation to course contents. Preparation of visit report and assessment.</p>	
<p>Suggested Text Books:</p>	
1.	S.P. Arora, S.P. Bindra, “A Text Book of Building Construction”, Dhanpat Rai Publications.
2.	B. C. Punmia, “Building Construction”, Laxmi Publications.
3.	R.K.Rajput, “Engineering Materials”, S. Chand Publications.
4.	Rangwala, “Engineering Materials”, Charotar Publications.
<p>Suggested Reference Books and IS codes</p>	
1.	Sandeep Mantri “A to Z of Practical Building Construction and Its Management”, Satya Prakashan, New Delhi.
2.	V.B. Sikka, “A Course in Civil Engineering Drawing”, S.K.Kataria and Sons .
3.	M.M. Goyal (Amrindra Consultancy (P) Ltd.), “Handbook of Building Construction”.
4.	R. Chudley (ELBS), “Construction Technology”, (Volume 1 to 4).
5.	UDCPR , Urban Development Department , Government of Maharashtra.
6.	“IS. 962 – 1989 Code for Practice for Architectural and Building Drawings”. SP 7, “National Building Code Group 1 to 5”, B.I.S. New Delhi

Class, Part & Semester		Second Year B. Tech (Civil Engineering), Part II & Sem III			
Course Title	:	Fluid Mechanics -I			Course Code: : CE214
Teaching Scheme (Hours)	:	Lecture :	03Hrs/week		Total Credits : 04
	:	Tutorial :	01Hrs/week		
Evaluation Scheme (Marks)	:	CIE=30 (20+10)	SEE = 70	Grand Total=100	Duration of SEE : 3 hrs
Revision:	:	Second			Month : June 2021
Pre-requisites (if any)	:	BS-11A2, BS-12B2, ES-11A2, ES-12B2			
Course Domain	:	Core			
Course Rationale:					
The course basically focuses on fluid mechanics and its properties, fluid statics, fluid kinematics, fluid dynamics, Flow through pipes with minor and major losses, Laminar flow, Turbulent flow and Boundary Layer Theory and Flow around Submerged Bodies is taught in this course.					
Course Objectives: The Course teacher will			Course Outcomes: Students will be able to		
1.	To study processes and science of fluid and their properties.	1.	Study the basic properties of fluids and their behavior under application of various force systems.		
2.	To study pressure measuring devices and pressure diagram.	2.	Discuss the basic concepts and principles in fluid statics, fluid kinematics and fluid dynamics with their applications in fluid flow problems.		
3.	To apply basic principles in fluid flow problems.	3.	Recognize the principles of continuity, momentum and energy as applied to fluid in motion.		
4.	To identify the losses in pipes.	4.	Apply the equations to analyze problems by making proper assumptions and learn systematic engineering methods to solve practical fluid mechanics problems.		
Curriculum Content					Hours
Unit I					8
Basic Concepts					
Fluid Properties: Viscosity, Newton law of viscosity, Vapour Pressure Cavitation, Surface Tension, Capillarity, Compressibility.					
Fluid Statics					
Fluid Pressure: Pascal's law, Pressure variation with temperature, density and altitude. Pressure measurement devices, Hydrostatic pressure and force. Buoyancy, Metacentre, Stability of Submerged and floating bodies.					

<p>Unit II Fluid Kinematics Classification of fluid flow: Continuity equations in Cartesian coordinates, Path line, Streak line, Stream line, and Stream tube, Stream function, Velocity potential function and their relationship, Flow net.</p>	7
<p>Unit III Fluid Dynamics Surface and body forces, Euler's Equations of motion, Bernoulli's equation, Energy Principle, Venturimeter, Orifice-meter and Pitot tube, Momentum principle, Vortex Flow Free and Forced.</p>	7
<p>Unit IV Flow through pipes Loss of head through pipes, Darcy-Wiesbatch equation, Major and Minor losses, Total energy equation, Hydraulic gradient line, Pipes in series, Equivalent pipes, Pipes in parallel, Siphon, Power transmission through pipes, Water hammer.</p>	6
<p>Unit V A. Laminar flow: Reynolds's Experiment, Laminar flow through: circular pipes and parallel plates, Hagen– Poiseuille equation. B. Turbulent flow: Velocity distribution and Shear stresses in turbulent flow, Prandtl mixing length theory, Hydro-dynamically smooth and rough boundary, Nikuradse's Experiment, Moody's Chart.</p>	6
<p>Unit VI Boundary Layer Theory and Flow around Submerged Bodies Assumption and concept of boundary layer theory. Boundary layer thickness, Laminar and Turbulent boundary layers on a flat plate; Laminar sub-layer, Smooth and Rough boundaries, Separation and its control, Stokes law, Concept of Drag and Lift.</p>	5
<p>Suggested list of Tutorials and Assignments Assignment No. 1: Fluid Properties & Fluid Statics with problems. Assignment No. 2: Fluid Kinematics with problems. Assignment No. 3: Fluid Dynamics with problems. Assignment No. 4: Flow through pipes with problems. Assignment No. 5: Laminar flow & Turbulent flow with problems. Assignment No. 6: Boundary Layer Theory & Flow around Submerged Bodies with problems.</p>	

General Instructions:	
Along with curriculum to expose students to various aspects in relation to course contents. Preparation of assessment as per unit wise.	
Suggested Text Books:	
1.	Modi/Seth, “Fluid Mechanics – Hydraulic and Hydraulic Mechanics”, Standard Book House, Delhi
2.	R.K.Bansal, LaxmiPubication -Fluid Mechanics and hydraulic machine
3.	A.K. Jain, “Fluid Mechanics”, Khanna Pub., Delhi.
5.	S. Nagrathanam, “Fluid Mechanics”, Khanna Pub., Delhi
6.	Fluid Mechanics through Problems – Garde R. J.
Suggested Reference Books:	
1.	Arora, “Fluid Mechanics”
2.	Franzini and Fennimore, “Fluid Mechanics”, Engineering applications Daugherty
3.	Garde-Mirajgaonkar, “Fluid Mechanics”, Nemchand and Bros., Roorkee
4.	H. Rouse, “Elementary Fluid Mechanics”, Toppan C. Ltd. Tokyo
5.	Shames, “Fluid Mechanics”, McGraw-Hill International Book Co., Auckland
6.	Streeter, “Fluid Mechanics”, Tata McGraw-Hill International Book Co., Auckland
7.	Munson, Young, Okiishi, Huebesch,– “Fundamentals of Fluid Mechanics”, Wiley Publication

Class, Part & Semester	:	Second Year B. Tech (Civil Engineering), Part II & Sem III					
Course Title	:	Lab-I Fluid Mechanics -I		Course Code:	:	CEL 215	
Teaching Scheme (Hours)	:	Practical :	2Hrs/week		Total Credits	:	01
Evaluation Scheme (Marks)	:	IPE/IOE= 50/Nil	EPE/EOE= Nil/Nil	Total= 50	Duration of EPE	:	02 Hrs
Revision:	:	Second			Month	:	June 2021
Pre-requisites (if any)	:	BS-11A2, BS-12B2, ES-11A2, ES-12B2, BS-11A3, ES-11A5, BS-12B3, ES-12B5					
Course Domain	:	Core					
Course Rationale:							
The course basically focuses on fluid mechanics and its properties, measuring devices, discharge measuring devices and metacentric height is taught in this course.							
Course Objectives: The Course teacher will				Course Outcomes: Students will be able to			
1.	To clarify the theory of fluid mechanics,			1.	Demonstrate measurement of fluid pressure in pipe flow and in open channel flow		
2.	To increase the investigative capacity of students and data acquiring skill and to establish its correlation with theory.			2.	Demonstrate an ability to measure discharge and losses in pipe flow		
3.	To study various pressure measuring devices, discharge measuring devices and metacentric height.			3.	Demonstrate an ability to verify stability of floating body and Bernoulli's Theorem		
4.	To understand the behaviour of flow nets through electrical analogy method.			4.	Demonstrate an ability to determine flow parameters in open channel flow		
List of Experiments							
Sr. No.	At least EIGHT experiments from the following.						
1.	Determination of metacentric height of Floating Body						
2.	Verification of Bernoulli's Theorem						
3.	Determination of coefficient of discharge of Venturimeter / orifice meter/ orifice						
4.	Measurement of discharge using mouthpiece.						

5.	Study of factors affecting coefficient of friction for pipe flow (at least for two different materials and two different diameters)
6.	Determination of loss of head due to i) Sudden expansion, ii) contraction iii) elbow iv) bend v) Globe Valve etc. (At least Two minor losses)
7.	Determination of Chezy's and Manning's constants
8.	Calibration of notches and Weirs
9.	Study of Impact of jet
10.	Visualization of Laminar and Turbulent flow using Reynold's Apparatus and determination its sample value
11.	Introduction of Computational Fluid Dynamics: CFD Software

General Instructions:

Along with curriculum to expose students to various aspects in relation to course contents.

Demo and preparation of experiments as per list.

Suggested Text Books/ Reference Books/Manual

1.	Modi/Seth, "Fluid Mechanics – Hydraulic and Hydraulic Mechanics", Standard Book House, Delhi
2.	R.K. Bansal, Laxmi Publication -Fluid Mechanics and hydraulic machine
3.	A.K. Jain, "Fluid Mechanics", Khanna Pub., Delhi
4.	S. Nagrathanam, "Fluid Mechanics", Khanna Pub., Delhi

Class, Part & Semester	:	Second Year B. Tech (Civil Engineering), Part II & Sem III				
Course Title	:	Laboratory II Strength of Materials		Course Code:	CEL216	
Teaching Scheme (Hours)	:	Practical :	2 hr /week		Total Credits	1
Evaluation Scheme (Marks)	:	IPE/IOE= Nil/Nil	EPE/EOE= 50/NIL	Total= 50	Duration of EPE	02 hours
Revision:	:	Second			Month	June 2021
Pre-requisites (if any)	:	BS-11A2, BS-12B2, ES-11A2, ES-12B2, BS-11A3, ES-11A5, BS-12B3, ES-12B5				
Course Domain	:	Core				
Course Rationale:						
Strength of Materials forms a core subject, taught to all students of the non-circuit disciplines of engineering. The study of this course is aimed at developing a thorough practical understanding of the basic material behaviour through simple experiments on different materials.						
Course Objectives: The Course teacher will				Course Outcomes: Students will be able to		
1.	To understand components of different equipments.			1.	Explain the components parts of the various equipments.	
2.	To study the behaviour of materials subjected to axial loading.			2.	Examine the engineering properties of material as per IS experimental norms and provisions.	
3.	Analyse SFD & BMD for the given beam.			3.	Draw SFD & BMD for the given beam	
4.	Determine Shear stress and Bending Stress distribution for given beams.			4.	Draw Shear stress and Bending Stress distribution for given beams.	
List of Experiments						
Sr. No.	A. Experiments (any five):					
	1. Tension test on Mild and TOR steel.					
	2. Compression test on different metals.					
	3. Compression test on Timber (parallel and across the grains).					
	4. Shear test on Mild steel.					
	5. Brinell and Rockwell Hardness test on different metals.					
	6. Impact test on different metals.					

	<p>7. Torsion test on mild steel.</p> <p>B. Experiments (any Two):</p> <p>1. Bending test on Mild steel.</p> <p>2. Flexure test on flooring tiles.</p> <p>3. Water absorption and compression test on Burnt brick.</p>
<i>Suggested Text Books/ Reference Books/Manual</i>	
1.	Strength of Materiall - F. L. Singer and Pytel, Harper and Row publication.
2.	Introduction to Mechanics of Solids - J.B. Popov, Prentice – Hall publication.
3.	Mechanics of Materialsl - Gere and Timoshenko, CBS publishers.
4.	Mechanics of Materialsl - R.C. Hibbler, Pearson Education.
5.	Institute’s Laboratory Course Manual and equipment wise Standard Operating Procedure.
6.	Mechanics of Materials Vol I and II - Punmia, Jain, Laxmi Publications
7.	Strength of Materials - S Ramamrutham, DhanapatRai Publications.
8.	Strength of Materials - Bhavikatti S.S., New Age Publications.

Class, Part & Semester	:	Second Year B. Tech (Civil Engineering), Part II & Sem III				
Course Title	:	Lab III Building Construction		Course Code:	: CEL 217	
Teaching Scheme (Hours)	:	Practical :	2Hrs/week		Total Credits	: 01
Evaluation Scheme (Marks)	:	IPE/IOE= Nil/Nil	EPE/EOE= 50/Nil	Total=50	Duration of EPE	: ----
Revision:	:	Second			Month	: June 2021
Pre-requisites (if any)	:	ES-12A2, ES-11B2, ES-12A2, ES-11B2				
Course Domain	:	Core				
Course Rationale: Different building components their significance and sketches are drawn in the course. Design of stairs is taught and problems are solved in this course.						
Course Objectives: The Course teacher will				Course Outcomes: Students will be able to		
1.	To draw a submission drawing Lettering, Symbols, Types of lines and dimensioning as per IS:962 and a working drawing of Stone Masonry: UCR, Course Rubble, Brick masonry: English bond, Flemish bond	1.	Prepare a sketch book consist Lettering, Symbols, Types of lines and dimensioning as per IS 962 and Prepare working drawing for Stone Masonry: UCR, Course Rubble, Brick masonry: English bond, Flemish bond.			
2.	To understand the geometric construction, multiview, dimensioning and detail drawings of Stairs: Dog legged and Open well, Quarter turn, bifurcated, Spiral, Geometrical	2.	Draw foundations: - Isolated, Combined Footing, Under Reamed Piles.(With reinforcement details).			
3.	To sketch Doors: Flush doors, Revolving door, Collapsible door and rolling shutter, Windows: Louvered window, Sliding Window, Bay window, Casement window, Dormer Window, Corner Window.	3.	Prepare drawing plan for Doors: T.W. Panelled Door, Windows: T.W. Glazed Window, Stairs: Dog legged and Open well			
4.	To Prepare working Sketch Book for Roofs: Line Sketches of steel trusses and to draw various types of building components.	4.	Prepare working Sketch Book for Roofs: Line Sketches of steel trusses and draw a various types of building components.			
List of Experiments /drawings /sketches						
Sr. No.						
1.	Prepare a sketch book consist Lettering, Symbols,					
2.	Types of lines and dimensioning as per IS 962.					

3.	Prepare drawing plan and sections for Doors: T.W. Panelled Door, Windows: T.W. Glazed Window, etc.
4.	Prepare plan and section of Stairs: Dog legged and Open well
5.	Draw foundations: - Isolated, Combined Footing, Under Reamed Piles.(With reinforcement details).etc.
6.	Prepare working drawing for Stone Masonry: UCR, Course Rubble, etc.
7.	Prepare working drawing for Brick masonry: English bond, Flemish bond.etc.
8.	Prepare working Sketch Book for Roofs: Line Sketches of steel trusses. Etc.
9.	Draw a various types of building components.
10.	Solving of problems on doors and windows.
11.	Solving of problems on stairs.
<p>General Instructions: Site Visits along with curriculum to expose students to various aspects in relation to course contents. Preparation of visit report and assesement.</p>	
<p><i>Suggested Text Books/ Reference Books/Manual/ codes</i></p>	
1.	V.B. Sikka, “A Course in Civil Engineering Drawing”, S.K. Kataria and Sons.
2.	Sandeep Mantri “A to Z of Practical Building Construction and Its Management”, Satya Prakashan, New Delhi.
3.	“IS. 962 – 1989 Code for Practice for Architectural and Building Drawings”.
4.	SP 7, “National Building Code Group 1 to 5 ”, B.I.S. New Delhi

Class & Semester	:	Second Year B. Tech (Civil Engineering), Part II & Sem III			
Course Title	:	Lab IV- Surveying			Course Code: : CEL218
Teaching Scheme (Hours)	:	Practical :	4 Hrs/week		Total Credits : 2
Evaluation Scheme (Marks)	:	IPE/IOE= 50/Nil	EPE/EOE= 50/Nil	Total=100	Duration of EPE : ----
Revision:	:	Second			Month : June 2021
Pre-requisites (if any)	:	ES-12A2 , ES-11B2, ES-12A5, ES-11B5			
Course Domain	:	Core			
Course Rationale: This Lab Course provides a practical exposure to carry out surveying work. Course focuses on study of various Surveying instruments which are used to carry out a particular survey.					
Course Objectives:			Course Outcomes: Students will be able to		
1.	To understand the use of basic surveying tools for land surveying.	1.	Use basic surveying tools such as Dumpy Level, Auto Level, Plane Table, Theodolite for Land Surveying.		
2.	To understand use of Theodolite survey in road construction	2.	Able to set out required curves on the field and calculate earthwork required for road construction.		
3.	To study advanced surveying instruments required for correct measurement.	3.	Use advanced instruments such as Electronic Theodolite, Total station for correct measurements.		
4.	To develop the skills required for team work.	4.	Increase the efficiency, speed of the work, the ability to focus different minds on the same problem and provide mutual support through team work.		
List of Experiments					
Sr. No.	Name of Experiment				
1.	To find sensitivity of Bubble Tube using Dumpy Level				
2.	Plane Table Survey- Radiation Method and Intersection Method.				
3.	Plane Table Survey- Resection Method- Three Point and Two Point Problem.				
4.	Computation of horizontal distances and elevations by Tacheometry.				
5.	Setting of a Simple Circular Curve using Theodolite.				
6.	Study and use of Electronic Theodolite and measurement of horizontal angle and vertical angle				
7.	Study and use of Total Station				
8.	Linear and angular measurement using Total Station				
9.	Total Station application- Missing Line Measurement, Resection				
10.	Set out points using Total Station				

11.	Total Station application- area, volume, remote elevation
12.	Total Station application –Road Stake out
Field Projects:	
1) Theodolite Traversing	
2) Preparation of Contour Map	
3) Profile Leveling and Cross sectioning	
4) Setting out a given building from a given foundation plan.	
General Instructions: Students should focus on understanding use of various instruments along with procedure to operate the same.	
<i>Suggested Text Books/ Reference Books/Manual</i>	
1.	K.R. Arora, “Surveying”, Vol. I,II, III ,Standard Book House
2.	C.D. Ghilani, “Elementary Surveying- An Introduction to Geomatics”, Pearson Publication
3.	W. Schofield, “Engineering Surveying”, Taylor and Francis Group
4.	B.C. Punmia, “Surveying”, Vol. I, II, III, Laxmi Publication.
5.	A.M. Chandra, “Plane Surveying”, New Age Publication
6.	A.M. Chandra, “Higher Surveying”, New Age Publication

Class, Part & Semester		: Second Year B. Tech (Civil Engineering), Part II & Sem III			
Course Title		Environmental Studies		Course Code	: HS211
Teaching Scheme (Hours)		Lecture :	02 Hours/Week	Total Credits	: Nil
		Tutorial :	00 Hours/Week		
Evaluation Scheme (Marks)		CIE = 00 SEE = 70	IPE=30 Project	: Grand Total=100	Duration of SEE : 3 hrs. At the year end
Revision		: Second		Month	: June 2021
Pre-requisites (if any)		: Completion of First Year Engineering, Revision of BS-12A2 namely Engineering Chemistry may help for better understanding.			
Course Domain		: Ethics and Environment			
Course Rationale: The Course is all about learning the way we should live and how we can develop sustainable strategies to protect the environment. It helps individuals to develop an understanding of living and physical environment and how to resolve challenging environmental issues affecting nature.					
Course Objectives: The Course Teacher will			Course Outcomes: Students will be able to		
1.	Define the course and indicate the importance of the same to the students.	1.	Recognize the scope and need of the course.		
2.	Enumerate the natural resources and make students visualize about associated problems.	2.	Identify the natural resources and detect the associated problems.		
3.	Describe and relate the ecosystems the engineering graduates.	3.	Relate values of ecosystems to human, plants and animals.		
4.	Explain concepts and theory in biodiversity and management from interdisciplinary perspectives.	4.	Identify key threats of biodiversity.		
Curriculum Content					Hours
Unit I Nature of Environmental Studies Definition, scope and importance, Significance of environmental studies, Multidisciplinary nature of environmental studies. Its need for public awareness.					05
Unit II Natural resources and associated problems a) Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining, dams and their effects on forests and tribal people. b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Usage and exploitation, environmental effects of extracting and using mineral					08

<p>resources. d) Food resources: World food problem, changes caused by agriculture effects of modern agriculture, fertilizer-pesticide problems. e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. g) Role of an individual in conservation of natural resources. h) Equitable use of resources for sustainable lifestyle.</p>	
<p>Unit III Ecosystems Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids. Introduction, types, characteristics features, structure and function of the following Ecosystem: a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)</p>	08
<p>Unit IV Biodiversity and its conservation Introduction – Definition: genetic, species and ecosystem diversity, Bio geographical classification of India, Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.; Biodiversity at global, National and local levels.; India as a mega-diversity nation; Western Ghats as a bio-diversity region; Hot-spots of biodiversity; Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; Endangered and endemic species of India; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.</p>	09
Suggested Text Books:	
1.	Agarwal, K. C. 2001, Environmental Biology, Nidi Publ. Ltd., Bikaner.
2.	Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad, 380013, India
3.	Brunner R. C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
Suggested Reference Books:	
1.	Clark R. S., Marine Pollution, Clarendon Press Oxford (TB) Pg No. 6
2.	Cunningham, W. P. Cooper, T. H. Gorhani, E. & Hepworth, M. T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p
3.	De A. K., Environmental Chemistry, Wiley Eastern Ltd.
4.	Down to Earth, Centre for Science and Environment (R)
5.	Gleick, H., 1993, Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute. Oxford Univ. Press 473p
6.	Hawkins R. e., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
7.	Heywood, V. H. & Watson, R. T. 1995, Global Biodiversity Assessment, Cambridge Univ. Press 1140p.

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8.	Jadhav, H. & Bhosale, V. M. 1995, Environmental Protection and Laws, Himalaya Pub. House, Delhi, 284p.
9.	Mckinney, M. L. & Schoel. R. M. 1996, Environmental Science Systems & Solutions, Web enhanced edition
10.	Mhskar A. K., Matter Hazardous, Techno-Science Publications (TB)
11.	Miller T. G. Jr., Environmental Science, Wadsworth Publishing Co. (TB)
12.	Odum, E. P. 1971, Fundamentals of Ecology, W. B. Saunders Co. USA, 574p.
13.	Rao M. N. & Datta, A. K. 1987, Waste Water Treatment, Oxford & IBH Publ. Co. Pvt. Ltd.,
14.	Sharma B. K., 2001, Environmental Chemistry, Goel Publ. House, Meerut
15.	Survey of the Environment, The Hindu (M)
16.	Townsend C., Harper, J. and Michael Begon, Essentials of Ecology, Blackwell Science (TB)
17.	Trivedi R. K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media (R)
18.	Trivedi R. K. and P. K. Goel, Introduction to air pollution Techno-Science Publications (TB)
19.	Wagner K. D., 1998, Environmental Management, W. B. Saunders Co. Philadelphia, USA.

Class, Part & Semester	Second Year B. Tech (Civil Engineering), Part II & Sem III				
Course Title	Introduction to Performing Arts			Course Code	HS212
Teaching Scheme (Hours)	2 Hours /Week= 2 x13= 26 hours			Total Credits	Nil
Evaluation Scheme (Marks)	Assignments	: 50	Written Test	: 25	Duration of SEE : NA
	Viva voce	: 25	Grand Total	: 100	
Revision:	Second			Month	June 2021
Pre-requisites (if any)	No pre-requisite as such is needed however students' involvement and interest in the classroom will make it more lively activity.				
Course Domain	Humanities and Arts				
<p>Course Rationale: Performing arts are an important part of our lives, our communication and our self-expression. These arts encourage learners to explore their emotions, expanding their imagination and helping them develop their own, unique voice. Each discipline, music, dance and drama, engage their brain, body and emotions in different ways to encourage their confidence and find joy in self-expression. So introducing the learner to such arts may be an interesting experience.</p>					
<p>Course Assessment Method: The students will be given five assignments each for 10 marks. At the end of the course, there will be a written test of 25 marks and a viva voce of 25 marks. All these assessments will be for a total of 100 marks. Based on the marks obtained, they will be awarded with a grade similar to other credit courses. Though it is an audit course, obtaining passing grade is essential.</p>					
Course Objectives: The Course Teacher will			Course Outcomes: Students will be able to		
1.	State about various performing arts and explain the importance of the same.		1.	Identify the types of performing arts and their differences with importance.	
2.	Elucidate about drama, Natya-Shastra etc.		2.	Acquire knowledge about drama, Natya-Shastra, street play etc.	
3.	Explain types of dance, will reveal about theaters.		3.	Demonstrate dance skills and organize about theater activities.	
4.	Demonstrate about Rag and Taal.		4.	Receive and respond to the Rag and Taal.	
5.	List Gharana system and classify Indian musical instruments.		5.	Identify Gharana and instruments of their choice and interest for practice	
6.	Summarize contribution of great musicians and outline about music concerts		6.	Recognize contribution of great musicians and display performances for a music concert.	
Curriculum Content					Hours
Unit I Introduction to Music, Dance & Drama, History of Indian Music, Various Forms of Vocal Music.					04
Unit II History and introduction of Drama, Bharat Muni Natya Shastra, street play, Sanskrit Natya, Marathi Sangit Rangbhumi.					04
Unit III					04

Dance, its type, Greek and Roman theatres.	
Unit IV Concept of Raga, Concept of Taal.	04
Unit V Notation System, Study of Gharana system in Music, Classification of Indian Instruments, Instrumental Music.	05
Unit VI Contribution of Great Musicians, Appreciation of Music. Performance of a Music Concert.	05
<i>Suggested Reference Books:</i>	
1.	Sangeet Visharad, Vasant, Sangeet Karyalaya, Hatras Prakashan.
2.	Suchita Bidkar, 'Sangeet Shastra Vigyan', Sanskar Prakashan.
3.	Sudhir Mainkar, 'Sangeet Kala Aani Shikshan', Sanskar Prakashan.
4.	Bhaskar Chandavarkar, 'Vadyavedh', Sanskar Prakashan.
5.	Arvind Mulgaonkar, 'Tabla', Popular Prakashan.
6.	Chris Hogget, 'All about theatre-Off stage'.
7.	Mrinalini Sarabhai, 'Understanding of Bharat Natyam'.
8.	Joan Borysenko, 'Minding the body and mending the mind'.
9.	V.K.Subbanna, 'Ragadalli Antrang'.

Class, Part & Semester	Second Year B. Tech (Civil Engineering), Part II & Sem IV			
Course Title	Theory of Structures-I			Course Code: CE221
Teaching Scheme (Hours)	Lecture :	04 Hrs/week		Total Credits : 05
	Tutorial :	01 Hrs/week		
Evaluation Scheme (Marks)	CIE=30 (20+10)	SEE = 70	Grand Total=100	Duration of SEE : 3 hrs
Revision:	Second			Month : June 2021
Pre-requisites (if any)	BS-11A2, BS-12B2, ES-11A2, ES-12B2, BS-11A3, ES-11A5, BS-12B3, ES-12B5, CE212			
Course Domain	Core			
Course Rationale:				
Theory of Structures forms a core course which is especially taught to students of Civil Engineering disciplines of engineering. The study of this course is aimed at developing an application thinking of the basic material behavior towards behavior of complex structures. It aims at developing an approach to solve structural engineering problems.				
Course Objectives: The Course teacher will			Course Outcomes: Students will be able to	
1.	To evaluate combined effect of direct and bending stresses.	1.	Extend the basic responses towards combined effect of loads.	
2.	To determine combined effects of beams and theories of failure.	2.	Analyse the stresses due to combination of load effects on beams and theories of failure.	
3.	To determine slope and deflection of beams.	3.	Analyse the slope and deflection of beams	
4.	To determine degree of indeterminacy and to evaluate deflections of beams and Trusses.	4.	Analyse the structures degree of indeterminacy and to Analyse the deflections of beams and Trusses.	
Curriculum Content				Hours
Unit I				9
Direct and Bending Stresses: Concept of direct and bending stresses; Applications to eccentrically loaded short columns, retaining walls, dams, chimneys etc., Effect of lateral force and self-weight; Resultant Stress diagrams due to axial loads, uniaxial, and biaxial bending; Concept of core of section for standard symmetrical sections. No tension condition.				
Unit II				9
a. Combined effects Combined Effects of axial stress, Bending moment, shear force and Torsional moment.				
b. Theories of failure Maximum Principal stress, Maximum Shear Stress, Maximum Strain Energy, Maximum Shear Strain and Maximum Principal Strain Theory.				

<p>Unit III Slope and Deflection of beams Introduction, Equation of elastic curve, Slope and deflection of statically determinate beams subjected to external loads by Integration method, Macaulay's method, moment area method, Conjugate beam method.</p>	<p>9</p>
<p>Unit IV a) Basic concepts of Structural Analysis – Types and Classification of structure based on Structural forms, Concept of indeterminacy and degrees of freedom -Static and Kinematic degree of indeterminacy. b.) Method of Consistent deformation: Propped cantilever with uniform section, fixed beam with basic released structure as cantilever or simply supported beam.</p>	<p>9</p>
<p>Unit V a) Concept of strain energy, strain energy due to axial, due to shear, bending moment and torsional moments. b) Energy Methods in Structural analysis - UNIT Load Method, UNIT Displacement Method, Castigliano's Theorems.</p>	<p>8</p>
<p>Unit VI a) Analysis of indeterminate structures, application of Castigliano's Theorem, Beams and Rectangular portal frames, Compatibility Methods, Maxwell's theorem of reciprocal displacements and Betti's law. b) To analyse Truss by method of joints and method of sections. c) Deflections of statically determinate pin jointed trusses using Castigliano's Theorem.</p>	<p>8</p>
<p style="text-align: center;">Suggested list of Tutorials and Assignments:</p> <ol style="list-style-type: none"> 1. Numericals on Direct and Bending Stress. 2. Numericals on Combined effects and Theories of failure. 3. Numericals on Slope and Deflection of beams. 4. Numericals on Concept of indeterminacy and degrees of freedom and Method of Consistent deformation. 5. Numericals on UNIT Load Method, UNIT Displacement. 6. Numericals to find Deflection of Truss using Castigliano's Theorem. 	
<p style="text-align: center;">Suggested Text Books:</p>	
<p>1.</p>	<p>Mechanics of Structure (Vol. I and II) - Junnarkar S.B. and Dr.H.J.Shaha, Charotar Publication.</p>
<p>2.</p>	<p>Mechanics of Materials Vol I and II - Punmia, Jain, Laxmi Publications.</p>
<p>3.</p>	<p>Strength of Materials - S Ramamrutham, Dhanapat Rai Publications.</p>
<p>4.</p>	<p>Strength of Materials - Bhavikatti S.S., New Age Publications.</p>

5.	Strength of Materials - R.K.Bansal., Laxmi Publications.
6.	Structural Analysis - Bhavikatti S.S, Vikas Publications House New Dehli.
<i>Suggested Reference Books:</i>	
1.	Strength of Material - F. L. Singer and Pytel, Harper and Row publication.
2.	Introduction to Mechanics of Solids - J.B. Popov, Prentice – Hall publication.
3.	Mechanics of Materials - Gere and Timoshenko, CBS publishers.
4.	Mechanics of Materials - R.C. Hibbler, Pearson Education.
5.	Mechanics of Material - Beer and Johnston, M.

Class, Part & Semester		: Second Year B. Tech (Civil Engineering), Part II & Sem IV			
Course Title	:	Concrete Technology			Course Code: : CE 222
Teaching Scheme (Hours)	:	Lecture :	04 Hrs/week		Total Credits : 04
	:	Tutorial :	00 Hrs/week		
Evaluation Scheme (Marks)	:	CIE=30 (20+10)	SEE = 70	Grand Total=100	Duration of SEE : 3 hrs
Revision:	:	Second			Month : June 2021
Pre-requisites (if any)	:	ES-12A2, ES-11B2, CE213			
Course Domain	:	Core: Theory			
Course Rationale: The course aims at imparting knowledge and skill to design the concrete mix required for structural elements subjected different site conditions. It also help to develop capability to supervise concreting operations involving proportioning, mixing, transporting, placing, compacting, finishing and curing of concrete. Hence this course has its stand alone value also.					
Course Objectives: The Course teacher will			Course Outcomes: Students will be able to		
1.	To familiarize the appropriate selection of concrete ingredients based on engineering concepts which are applied in field Construction Fields.	1.	Select appropriate concrete ingredients based on engineering concepts which are applied in field Construction Fields.		
2.	Elaborate procedure to design a concrete mix which fulfils the required properties for fresh and hardened concrete.	2.	Design a concrete mix which fulfils the required properties for fresh and hardened concrete.		
3.	Illustrate application of fundamental knowledge in the fresh and hardened properties of concrete.	3.	Apply fundamental knowledge in the fresh and hardened properties of concrete.		
4.	Encourage students to critically think for the utilization of waste materials as novel innovative materials for use in concrete and to get acquainted with recent developments in the field of Concrete Technology.	4.	Able to critically think for the utilization of waste materials as novel innovative materials for use in concrete and to get acquainted with recent developments in the field of Concrete Technology.		

<i>Curriculum Content</i>	Hours
<p>Unit I</p> <p>Ingredients of Concrete</p> <p>a) Cement: Physical properties of cement such as fineness, consistency test, Initial and final setting time, soundness, compressive strength, specific gravity. Hydration of cement, chemical compounds of cement. Grades of cement, Types of cement- Ordinary Portland, Portland pozzolana, Rapid Hardening Portland Cement, Quick setting cement, Sulphur resisting cement, Super sulphated cement, Expansive cement, Rediset cement, High strength cement, High Alumina, Low heat, White, Coloured, Oil well, Hydrophobic cement.</p> <p>b) Aggregates: Physical properties such as sieve analysis and fineness modulus, specific gravity and water absorption, silt content, Bulking of sand, Bulk density, moisture content, Flakiness index, Elongation index. Mechanical properties such as Crushing, Impact and Abrasion value, Alkali – Aggregate reaction, Grading of Aggregate, Artificial and recycled aggregate.</p> <p>c) Water: Specifications of water as per IS 456 – 2000.</p>	7
<p>Unit II</p> <p>Admixtures: Types of admixtures, Plasticizers and super-plasticizers and their effects on workability, Role of plasticizers, Air entraining agents, Retarders, their effects on proportion of concrete, Pozzolanic admixtures, Fly ash, fly ash on fresh concrete, Silica fume, Metakaolin, Ground Granulated Blast Furnace Slag.</p>	8
<p>Unit III</p> <p>Concrete Mix Design: Nominal Mix Concrete, Objectives of mix design, Factors governing mix design, Methods of expressing proportions, statistical quality control. Mix design , ACI 211.1-91 method, Indian Standard method as per IS:10262 and IS:456, DOE method and acceptance criteria</p>	8
<p>Unit IV</p> <p>Fresh Concrete: Batching, Mixing, Transportation, Placing of concrete including pumping and compaction techniques for good quality concrete, Workability of concrete and methods of measuring workability, Factors affecting workability, Segregation and bleeding, Curing of concrete, Different methods of curing, Temperature effects on fresh concrete.</p>	5
<p>Unit V</p> <p>Hardened Concrete: Strength of concrete, w/c ratio, Gel-space ratio, Effect of maximum size of aggregate, Factors affecting strength of concrete, Characteristic strength - compressive, tensile</p>	8

<p>and flexure strength, Relation between compressive and tensile strength. Modulus of elasticity, Relation between modulus of elasticity and strength, Creep and shrinkage of concrete.</p> <p>Durability of concrete: Minimum and Maximum cement content, Strength and durability relationship, Volume change in concrete, Impact of w/c ratio on durability, permeability, carbonation, Accelerated Carbonation test, Sorptivity, Exposure to different conditions as per IS 456, Sulphate attack, Alkali aggregate reaction, Chloride attack, Corrosion of steel (chloride induced), Rapid Chloride permeability test, Corrosion Control,</p>	
<p>Unit VI</p> <p>Special concrete: Light weight concrete, No fines concrete, High density concrete, Fibre reinforced concrete and different types, Polymer concrete, High performance concrete, Self compacting concrete, Cold weather concreting, Hot weather concreting, Vacuum concrete, Shotcreting.</p> <p>Non-destructive testing: Schmidt's rebound hammer – Mechanical and digital, Ultrasonic pulse velocity method, techniques of measuring and factors affecting the measurement of pulse velocity, Corrosion meter, Cover meter. Case study based on structural audit.</p>	9
<p>Suggested list of Tutorials and Assignments:</p> <ol style="list-style-type: none"> 1. Ingredients of concrete 2. Fresh concrete 3. Admixtures 4. Hardened concrete 5. Concrete Mix Design 6. Durability of concrete 7. Special concrete 8. Non-destructive testing 	
<p>Suggested Text Books:</p>	
1.	M.S. Shetty, "Concrete Technology", S. Chand and Company Ltd, New Delhi.
2.	M.L. Gambhir, "Concrete Technology", Tata McGraw-Hill publishing Company Ltd, New Delhi.
<p>Suggested Reference Books:</p>	
1.	Handoo, Puri and Kaila, "Concrete Technology", Satya Prakashan, New Delhi, 2008.
2.	M. Neville, "Concrete Technology", Pearson Education, New Delhi, 1981.
3.	Orchard, "Concrete Technology", Asia publication, New Delhi, 1986.
4.	F.M. Lea, "The Chemistry of Cement and Concrete", Chemical Publishing Company, Inc., New York, 1971.
5.	S. Mindess and J.F. Young, "Concrete", Prentice Hall, Inc., NJ, 2005.
6.	J. Newman and B.S. Choo, "Advanced Concrete Technology", Four Volume Set, Elsevier, 2003.

Reference Codes:	
1.	IS: 456-2000, "Plane and Reinforced Concrete-Code of Practice", Bureau of Indian Standard, New Dehli.
2.	IS: 10262-2009, "Guidelines for Concrete Mix Proportioning", Bureau of Indian Standard, New Dehli
3.	IS: 383-2016, "Concrete Specification Coarse and Fine Aggregate for (Third Revision)", Bureau of Indian Standard, New Dehli.
4.	IS: 4031-1996, "Methods of Physical Tests for Hydraulic Cement", Bureau of Indian Standard, New Dehli.
5.	IS: 2386-1963, "Methods of Test for Aggregates for Concrete", Bureau of Indian Standard, New Dehli.
6.	IS: 7320-1974, "Specification for Concrete Slump Test Apparatus", Bureau of Indian Standard, New Dehli.
7.	IS: 1199-1959, "Methods of Sampling and Analysis of Concrete", Bureau of Indian Standard, New Dehli.
8.	Code No. 21, "Concrete Mix Design", All India Council for Technical Education, New Dehli.

Class, Part & Semester		Second Year B. Tech (Civil Engineering), Part II & Sem IV			
Course Title	:	Fluid Mechanics -II			Course Code: : CE223
Teaching Scheme (Hours)	:	Lecture :	03Hrs/week		Total Credits : 03
	:	Tutorial :	00Hrs/week		
Evaluation Scheme (Marks)	:	CIE=30 (20+10)	SEE = 70	Grand Total=100	Duration of SEE : 3 hrs
Revision:	:	Second			Month : June 2021
Pre-requisites (if any)	:	BS-11A2, BS-12B2, ES-11A2, ES-12B2			
Course Domain	:	Core			
Course Rationale:					
The course basically focuses on uniform flow in open channel, steady and uniform flow, depth energy relationship in open channel flow, gradually varied flow, rapidly varied flow, spatially varied flow, notches and weirs, impact of jet & hydraulic turbines & centrifugal pump is taught in this course.					
Course Objectives: The Course teacher will			Course Outcomes: Students will be able to		
1.	To study uniform and non-uniform flow in open channel.	1.	Provide students with basic knowledge of fluid properties and utilizing principles developed in fluid mechanics.		
2.	To apply basic principles in fluid flow problems.	2.	Develop the principle and equation for pressure flow and momentum analysis.		
3.	To study velocity and discharge measurement devices.	3.	Provide the students with the analytical knowledge of pressure and velocity distribution in an open channel in order to solve practical problems.		
4.	To study impact of jet, Pumps and turbines	4.	Illustrate and develop the equations and design principles for open channel flows, including sanitary and storm sewer design and flood control hydraulics.		
Curriculum Content					Hours
Unit I					7
A. Uniform Flow in Open Channel					
Introduction, Difference between Pipe Flow & Open Channel Flow. Types of Open Channels, Types of Flows in Open Channel, Geometric Elements, Velocity Distribution, Measurement of Velocity- (Pitot Lube, Current Meter)					
B. Steady and Uniform Flow					
Chezy's and Manning's Formula, Uniform Flow Computations, Hydraulically Efficient Section (Rectangular, Triangular, Trapezoidal)					

<p>C. Depth Energy Relationship in Open Channel Flow Specific Energy (Definition and Diagram, Critical, Sub-Critical, Super-Critical Flow), Specific Force (Defn & Diagram)</p>	
<p>Unit II Gradually Varied Flow (GVF) Definition, Classification of Channel Slopes, Dynamic Equation of GVF (Assumption and Derivation), Classification of GVF Profiles- Practical Examples, Direct Step Method of Computation of GVF Profiles</p>	6
<p>Unit III A. Rapidly Varied Flow (RVF) Definition, Hydraulic Jump- Phenomenon, Conjugate Depth Relationship, Characteristics, Uses and Types of Hydraulic Jump, Hydraulic Jump as an Energy Dissipater B. Spatially Varied Flow Basic Principles and Assumptions, Dynamic Equation and Analysis of Flow Profiles, Isoclinal Method, Spatially Varied Steady & Unsteady Surface Flows.</p>	7
<p>Unit IV Notches and Weirs Types, Derivation of Discharge Equation, Velocity of Approach, Francis Formula, Calibration of Notches, Errors in Measurement of Discharge, Sharp, Broad & Round Crested Weirs, Calibration of Weir, Time of Emptying Tank with Weir.</p>	6
<p>Unit V Impact of Jet: Impulse Momentum Principle, Impact of Jet on Vanes- Flat, Curved (Stationary and Moving), Inlet and Outlet Velocity Triangles, Series of Flat, Curved Vanes Mounted on Wheel.</p>	6
<p>Unit VI A. Hydraulic Turbines Importance of Hydro-Power, Classification of Turbines- Pelton, Francis and Kaplan Turbine (Detailed Design Need Not to Be Dealt with), Unit Quantities, Specific Speed, Performance Characteristics, Selection of Type of Turbine, Concept of Draft Tube. B. Centrifugal Pump Classification, Component Parts, Working of Centrifugal Pump, Performance Characteristics, Common Pump Troubles and Remedies, Net Positive Suction Head (NPSH).</p>	7

Suggested list of Tutorials and Assignments:

Assignment No. 1: Uniform flow in open channel, steady and uniform flow & depth energy relationship in open channel flow with problems.

Assignment No. 2: Gradually varied flow with problems.

Assignment No. 3: Rapidly Varied Flow, Spatially Varied Flow with problems.

Assignment No. 4: Notches and Weirs with problems.

Assignment No. 5: Impact of Jet with problems.

Assignment No. 6: Hydraulic Turbines, Centrifugal Pump with problems.

General Instructions:

Along with curriculum to expose students to various aspects in relation to course contents. Preparation of assessment as per unit wise.

Suggested Text Books:

1.	Modi/Seth, "Fluid Mechanics – Hydraulic and Hydraulic Mechanics", Standard Book House, Delhi
2.	A.K. Jain, "Fluid Mechanics", Khanna Pub., Delhi.
3.	K. L. Kumar, "Fluid Mechanics", Eurasia Publication House, Delhi

Suggested Reference Books:

1.	K. Subramanyam, "Flow in open channel", Tata McGraw-Hill Pub. Co., Delhi
2.	K. Subramanyam, "Fluid Mechanics", Tata McGraw-Hill Pub. Co., Delhi
3.	Rangaraju, "Open Channel flow", Tata McGraw-Hill Pub. Co., Delhi
4.	Streeter, "Fluid Mechanics", McGraw-Hill International Book Co., Auckland
5.	V. T. Chaw, "Flow in open channel", McGraw-Hill International Book Co., Auckland
6.	R.C. Hibbeler, "Fluid Mechanics", Pearson Publication.

Class, Part & Semester		Second Year B. Tech (Civil Engineering), Part II & Sem IV				
Course Title		Building Planning and Drawing		Course Code:	CE224	
Teaching Scheme (Hours)		Lecture :	4Hrs/week		Total Credits	04
		Tutorial :	0Hrs/week			
Evaluation Scheme (Marks)		CIE=30 (20+10)	SEE = 70	Grand Total=100	Duration of SEE	4hrs
Revision:		Second			Month	June 2021
Pre-requisites (if any)		ES-12A2, ES-11B2, CE213				
Course Domain		Core				
Course Rationale:						
The course basically focuses on planning and designing of residential building from conception stage to final drawing. Details of submission drawing are discussed and used widely. Building planning bye laws and regulations, their significance are included in this course. Concepts of low cost housing, repairs, rehabilitation of structures are discussed. Building services like plumbing, electrification, ventilation, air conditioning, thermal insulation, sound insulation etc. are explained in this course. Also plastering, paints, pop etc.						
Course Objectives: The Course teacher will				Course Outcomes: Students will be able to		
1.	To illustrate the principles of planning in the design of residential buildings	1.	Develop the ability and apply the principles of planning in the design of residential buildings			
2.	To illustrate the importance and application of regulations such as building bye laws and provisions of codes.	2.	Explain the importance and application of regulations such as building bye laws and provisions of codes.			
3.	To know the importance of low cost housing & concepts of green buildings.	3.	Develop awareness of low cost housing & green building			
4.	To study and identify plumbing system, air conditioning system, electrification system, ventilation, sound insulation and to identify and know details of paint component, information about building finishing like plastering, pointing, dado, POP, wall paper.	4.	Draw layouts of plumbing system, air conditioning system, electrification system, ventilation and explain importance of paint component, information about building finishing like plastering, pointing, dado, POP, wall paper			
Curriculum Content						Hours
Unit I						
Planning of Residential Buildings						7
Site Selection criteria. Principles of Building planning. Significance Sun diagram. Wind Diagram. Orientation, Factors affecting, criteria under Indian condition.						
Unit II						
Building Planning Byelaws & regulations as per SP-7, 1983 National Building code of India group 1 to 5 (introduction only). Planning of Residential Building [Bungalows, Row Bungalows,						10

<p>Apartments and Twin Bungalows (conceptual only)] UDCPR Urban Development Department , Government of Maharashtra. Chapter 1 - Introduction to Administration , Chapter 2 - Development permission and commencement certificate. Chapter 6 - General building requirements etc. Chapter 9 - Requirements of part of building. Chapter 12 - Structural safety , Water supply ,drainage , sanitary requirements etc.</p>	
<p>Unit III Low cost Housing Materials & Methods (conceptual introduction only) Maintenance, Repairs, Rehabilitation of Structures. (conceptual introduction only)</p>	4
<p>Unit IV Plumbing system Various Materials for system like PVC, GI, AC, CI, HDPE . Various types of traps, Fittings, Chambers. Need of Septic Tank, Concept of Plumbing & Drainage plan, introduction to rainwater harvesting. Terrace drainage plan . Electrification: Concealed & Open Wiring, Requirements & Location of various points, Concept of Earthing. Fire resistance in building: Fire protection precautions, confining of fire, fire hazards, Characteristics of fire resisting building materials and their resistance to fire.</p>	8
<p>Unit V Ventilation: Definition and necessity of Ventilation, functional requirement, various systems. Air conditioning: Purpose, Classification, Principles, Systems & Various Components of the same. Thermal Insulation: General concept, Principles, Materials, Methods. Introduction to Acoustics: - Absorption of sound, various materials, Sabine's formula, optimum reverberation time, conditions for good acoustics. Sound Insulation: Acceptable noise levels, Noise prevention at its source, Transmission of Noise: Noise control-general considerations.</p>	8
<p>Unit VI Paints Different types and application methods. Varnishes & application methods.</p>	7

<p>Plastering, Pointing & various techniques. Tile cladding, skirting, and dado work with various materials.</p> <p>Miscellaneous finishes such as POP, sand blasting techniques, wall paper.</p>	
<p>Suggested list of Assignments:</p> <ol style="list-style-type: none"> 1. Principles of Building planning. 2. Sun Diagram, Wind rose Diagram. 3. Factors affecting Orientation. 4. UDCPR Urban Development Department , Government of Maharashtra , Introduction to Administration . Chapter 1 - 5. Chapter 2 - Development permission and commencement certificate. 6. Chapter 6 - General building requirements etc. 7. Chapter 9 - Requirements of part of building. 8. Chapter 12 - Structural safety , Water supply ,drainage , sanitary requirements etc. 9. Details of Septic Tank, Plumbing & Typical Drainage plan, Typical rainwater harvesting system. Terrace drainage plan . Concept of Earthing with sketch. 10. Auto- Cad commands . <p>General Instructions: Site Visits along with curriculum to expose students to various aspects in relation to course contents . Preparation of visit report and assesement.</p>	
<p><i>Suggested Text Books:</i></p>	
1.	Building planning and drawing: Dr. N Kumarswamy, A. Kameshwara Rao
2.	“Building Construction” Arora N.L. and Gupta B.R, Satya Prakashan
3.	Shah, Kale, Patki, “ Building Drawing”, Tata McGraw- Hill
4.	S.P. Arora, S.P. Bindra, “A Text Book of Building Construction”, Dhanpat Rai Publications.
<p><i>Suggested Reference Books/ codes :</i></p>	
1.	A Text book of Building Drawing: Gangrad M.N, Deshmukh B.S., Kanitkar A.K.,Nirali Prakashan
2.	Civil Engineering Drawing: Charusheela, M. S., Jamadar, NiraliPrakashan
3.	SP 7- National Building Code Group 1 to 5 - B.I.S. New Delhi
4.	UDCPR , Urban Development Department , Government of Maharashtra.
5.	V.B. Sikka, “A Course in Civil Engineering Drawing” , S.K .Kataria and Sons .

Class, Part & Semester		: Second Year B. Tech (Civil Engineering), Part II & Sem IV			
Course Title		: Engineering Geology		Course Code:	: CE 225
Teaching Scheme (Hours)		Lecture :	3 Hrs/week	Total Credits	: 03
		Tutorial :	-- Hrs/week		
Evaluation Scheme (Marks)		CIE=30 (20+10)	SEE = 70	Grand Total=100	Duration of SEE : 3 hrs
Revision:		: Second			Month : June 2021
Pre-requisites (if any)		: ES-12A2, ES-11B2, CE213			
Course Domain		: Core: Theory			
Course Rationale: To understand geology of the construction site the subject is important.					
Course Objectives: The Course teacher will			Course Outcomes: Students will be able to		
1.	To Understand the Earth System	1.	Student will generate global vision of Earth processes and identify the subsurface material		
2.	To know about the material present i.e. Mineral and rocks and to understand Structural deformations and impacts.	2.	Student will know reasons of phenomena like Earthquakes and Tsunamis and know about groundwater availability zones and groundwater management.		
3.	To know subsurface exploration methods and to know groundwater availability and domains: recharge	3.	Student will know megascopic and mechanical properties of rocks and student will know field procedures of subsurface explorations and generate subsurface profiles and map structures		
4.	To Study techniques for site selection for Projects.	4.	Student will know considerations for site selection for engineering projects.		
Curriculum Content					Hours
Unit I Introduction and Physical Geology Definition, Scope and Subdivisions, applications of Geology in Civil Engineering, Major features of the Earth's structure, Internal structure of earth, and Geological work of river: features of erosion, deposition and transportation, Civil Engineering Significance, Geological work of wind: Processes and features of erosion, deposition and transportation, Civil Engineering Significance. Volcano: Central and Fissure types, Products of volcano, Mountain: Origin and formation, types, examples					7
Unit II Mineralogy and Petrology Mineralogy: Physical properties of minerals, Petrology: Definition, rock cycle, Igneous rocks: Origin, Textures and Structures, Classification, Concordant and Dis-concordant Intrusions, Civil					8

Engineering Significance, Secondary deposits: Formation, Textures, Classification and Structures, Civil Engineering Significance, Chemical and organic deposits, Metamorphic rocks: Agents and Types of Metamorphism, stress and anti-stress minerals, Structures, Product of metamorphism.	
Unit III Structural Geology Outcrop, Strike and Dip, Unconformity- Types, Outliers and Inliers, Overlap, Fold and Fault: Parameters, Classification Causes, Civil Engineering significance Joint: Types, Civil Engineering considerations	8
Unit IV Earthquake: Terminology, Causes, Seismic waves, Seismograph, Seismogram, Scale, Effects, RIS Landslides : Types, Causes, Prevention of Landslides. Groundwater: Sources of groundwater, Zones of groundwater, Types of Aquifer, Hydrological properties of aquifers. Building stones: Engineering properties of ROCKS Requirement of good building stone.	5
Unit V Preliminary -Geological Explorations and State of Art Techniques in Engineering Geology: Use of Geological maps and sections. Verification of surface data by subsurface exploration. Drill holes, test pits, trenches, exploratory tunnels, shafts, adits, drifts, etc. Compilation and interpretation of information obtained from these, Correlation of surface data with results of subsurface exploration. Limitations of drilling. Comparative reliability of data obtained by drilling and excavation. Engineering significance of Geological structures such as stratification, dips, folds, faults, joints, Fractures, crush zones, fault zones, dykes, etc. Case histories. Computational Engineering Geology, GIS, Remote Sensing and its applications. Mapping Techniques in Engineering Geology	8
Unit VI Tunnelling, Dams and Reservoirs: Influence of geological conditions on design and construction methods, Preliminary Geological investigations for tunnels. For tunneling. Unlined tunnels. Case histories. Dependence of strength, stability and water tightness of foundation rocks and their physical Characters and	9

<p>Geological structures. Influence of geological condition on the choice of type And design of dams. Preliminary geological work on dam sites. Favourable and unsuitable Geological conditions for locating a dam. Precaution to be taken to counteract unsuitable Condition, Treatment of leaky rocks faults, dykes, crush zones, joints, fractures, unfavourable Dips, etc. Earth quakes in regions of dams. Case histories.</p> <p>Dependence of water tightness on physical properties and structure of rocks. Geological Conditions suitable and unsuitable for reservoir sits. Conditions likely to cause leakage Through reservoir rims. Importance of ground water studies and effects of raising of the water table. Case histories. etc.</p>	
<p>Suggested list of Tutorials and Assignments:</p>	
<p style="text-align: center;"><i>Suggested Text Books:</i></p>	
1.	Prabin Singh, “Engineering and General Geology”, S. K. Katariya and sons, Delhi.
2.	R. B. Gupte, “A Text Book of Engineering Geology”, Vidyarthi Griha Prakashan, Pune.
3.	P. K. Mukerjee, “A Text Book of Geology”, The World Press Pvt. Ltd., Calcutta
<p style="text-align: center;">Suggested Reference Books:</p>	
1.	Holmes, “Principles of Physical Geology”, ELBS Chapman & Hall, London.
2.	S. Sathya Narayanswami, “Engineering Geology”, Dhanpat Rai & Co.(P)Ltd, Delhi.
4.	P. Krynine & W. R. Judd, “Principles of Engineering Geology and Geotechnics”, CBS Publishers & Distributors, New Delhi.
5	Dr. D. V. Reddy, “Engineering Geology for Civil Engineering”, Oxfard & IBH Publishing Co. Pvt. Ltd., New Delhi.
6	Engineering Geology Laboratory Manual.

Class, Part & Semester	Second Year B. Tech (Civil Engineering), Part II & Sem IV			
Course Title	Lab I Concrete Technology			Course Code: : CEL 227
Teaching Scheme (Hours)	Practical :	02 Hrs/week		Total Credits : 01
Evaluation Scheme (Marks)	IPE/IOE= 50/Nil	EPE/EOE= 50/Nil	Total=100	Duration of EPE : ----
Revision:	Second			Month : June 2021
Pre-requisites (if any)	ES-12A2, ES-11B2, ES-12A2, ES-11B2			
Course Domain	Core: Practical			
Course Rationale: The course aims at imparting knowledge and skill to design the concrete mix required for structural elements subjected different site conditions. It also help to develop capability to supervise concreting operations involving proportioning, mixing, transporting, placing, compacting, finishing and curing of concrete. Hence this course has its stand alone value also.				
Course Objectives: The Course teacher will			Course Outcomes: Students will be able to	
1.	Familiarize procedures to determine the properties of concrete ingredients i.e. cement, fine and coarse aggregate by conducting different laboratory test.		1.	Determine the properties of concrete ingredients i.e. cement, fine and coarse aggregate by conducting different laboratory test.
2.	Illustrate properties of fresh and hardened concrete and apply knowledge for use of concrete at relevant site.		2.	Determine the properties of fresh and hardened concrete.
3.	Elaborate procedure to design a concrete mix from laboratory test data of ingredients of concrete which fulfils the required properties for fresh and hardened concrete.		3.	To Design Concrete Mix Proportioning by Using Indian Standard Method
4.	Demonstrate the non-destructive test procedures on concrete and apply knowledge for the quality assurance without destructing the structure.		4.	Understand the non-destructive test procedures on concrete.
List of Experiments				
Sr. No.	Any 8 set of experiments			
1.	Testing of cement: Consistency, fineness, setting time, specific gravity, soundness and compressive strength.			
2.	Testing of fine aggregate: Specific gravity, sieve analysis and zoning, bulking of fine aggregate, bulk density, silt content.			
3.	Testing of coarse aggregate: Specific Gravity, sieve analysis, bulk density, flakiness index, elongation-index, water absorption and moisture content, soundness of aggregate.			
4.	Concrete Mix design: IS code method as per IS: 10262- 2007 and IS: 456-2000			

5.	Workability Tests on Fresh Concrete: Slump cone test, Compaction factor test, Vee-bee Consistometer Test, flow table test
6.	Strength tests of Hardened concrete - compressive strength by cube and cylinder, flexural strength, split tensile strength.
7.	Effects of Admixture - Accelerator, Retarder, Super Plasticizer.
8.	Non-destructive Testing - Rebound Hammer test, Ultrasonic Pulse Velocity test.
9.	Durability Test: Accelerated Carbonation Test, Oxygen permeability Test, Rapid permeability Test, Sorptivity test, Germann water permeability, Wenner 4 probe resistivity.
10.	Micro structural study of concrete through XRD, SEM
11.	Field visit to construction site to observe manufacturing of concrete.
<i>Suggested Text Books/ Reference Books/Manual/Reference Code</i>	
1.	IS: 456-2000, "Plain and Reinforced Concrete-Code of Practice", Bureau of Indian Standard, New Dehli.
2.	IS: 10262-2009, "Guidelines for Concrete Mix Proportioning", Bureau of Indian Standard, New Dehli
3.	IS: 383-2016, "Concrete Specification Coarse and Fine Aggregate for (Third Revision)", Bureau of Indian Standard, New Dehli.
4.	IS: 4031-1996, "Methods of Physical Tests for Hydraulic Cement", Bureau of Indian Standard, New Dehli.
5.	IS: 2386-1963, "Methods of Test for Aggregates for Concrete", Bureau of Indian Standard, New Dehli.
6.	IS: 7320-1974, "Specification for Concrete Slump Test Apparatus", Bureau of Indian Standard, New Dehli.
7.	IS: 1199-1959, "Methods of Sampling and Analysis of Concrete", Bureau of Indian Standard, New Dehli.
8.	Code No. 21, "Concrete Mix Design", All India Council for Technical Education, New Dehli.

Class, Part & Semester	:	Second Year B. Tech (Civil Engineering), Part II & Sem IV				
Course Title	:	Lab II Engineering Geology		Course Code:	: CEL 227	
Teaching Scheme (Hours)	:	Practical :	02 Hrs/week		Total Credits	: 01
Evaluation Scheme (Marks)	:	IPE/IOE= 50/Nil	EPE/EOE= Nil/Nil	Total=50	Duration of EPE	: ----
Revision:	:	Second			Month	: June 2021
Pre-requisites (if any)	:	ES-12A2, ES-11B2, ES-12A2, ES-11B2				
Course Domain	:	Core: Practical				
Course Rationale: To understand geology of the construction site the subject is important.						
Course Objectives: The Course teacher will			Course Outcomes: Students will be able to			
1	Explain physical properties of the minerals.	1.	Identify various minerals			
2.	Explain Identification of minerals and rocks.	2.	Identify various rocks.			
3.	Explain of Geological maps and Profiles.	3.	Understand and draw geological sections.			
4.	Explain core samples, RQD and Rock mass rating problems	4.	Understand rock quality.			
List of Experiments						
Sr. No.	Any eight of following:					
1.	Megascopic study of Rock forming minerals.					
2.	Megascopic study of Ore forming minerals.					
3.	Megascopic study of Igneous rocks.					
4.	Megascopic study of Secondary rocks.					
5.	Megascopic study of Metamorphic rocks.					
6.	Study of geological maps.					
7.	Study of Structural Geological models.					
8.	To Solve Rock Mass Rating(RMR) and RQD problems and to study Electrical Resistivity Survey					
9.	Study tour to the places of Engineering Geological importance.					
Suggested Text Books/ Reference Books/Manual/Reference Code						

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1.	FGH Blyth, and M.H. De Freitas, “Geology for Engineers”, ELBS.
2.	G. W. Tyrrell, “Principles of Petrology”, B. I. Publication Pvt. Ltd., New Delhi.
3.	H. H. Read, “Rulley’s Elements of Mineralogy”, CBS Publishers & Distributors, Delhi.
4.	Kiefer and Lilleesand, “ Remote Sensing and Image Interpretation”
5.	K. V. G. K. Gokhale & D. M. Rao, “Experiments in Engineering Geology”, TMN, New-Delhi.
6.	L. W. Farmer, “Engineering Properties of Rocks”, Champman & Hall, London.
7.	M. P. Billings, “Structural Geology”, Prentice Hall of India Private Ltd., New Delhi.
8.	R. F. Legget, “Geology Hand book in Civil Engineering”, McGrawHill, New York.

Class, Part & Semester	:	Second Year B. Tech (Civil Engineering), Part II & Sem IV			
Course Title	:	Lab-III Fluid Mechanics –II		Course Code:	: CEL 228
Teaching Scheme (Hours)	:	Practical :	2Hrs/week		Total Credits : 01
Evaluation Scheme (Marks)	:	IPE/IOE= Nil/Nil	EPE/EOE= 50/Nil	Total= 50	Duration of EPE : 02 Hrs
Revision:	:	Second			Month : June 2021
Pre-requisites (if any)	:	BS-11A2, BS-12B2, ES-11A2, ES-12B2, BS-11A3, ES-11A5, BS-12B3, ES-12B5			
Course Domain	:	Core			
Course Rationale:					
The course basically focuses on types of notch, hydraulic jump, turbines, hydraulic tilting flumeis taught in this course.					
Course Objectives: The Course teacher will			Course Outcomes: Students will be able to		
1.	Identify, name, and characterize flow patterns and regims in open channels.	1.	Understand the fluid flow in open channels uniform flow depth energy relationship in open channel flow: Specific energy		
2.	Demonstrate practical understanding of continuity equation.	2.	Understand the rapidly flow and its applications through computations and measurement of flow in open channels through notches and weirs.		
3.	Demonstrate practical understanding of application of notches and weir to measure the rate of flow.	3.	Understand the Impulse momentum principle, Impact of jet on Vanes-flat, curved (stationary only)		
4.	Demonstrate and explain concept of Hydraulic machines	4.	Understand working principle of turbine, and pumps		
List of Experiments					
Sr. No.	At least EIGHT experiments from the following.				
1.	Study of Hydraulic Tilting Flume.				
2.	Calibration of V-Notch.				
3.	Calibration of Rectangular Notch.				
4.	Calibration of Trapezoidal Notch.				
5.	Study of Flow over Sharp Crested Weir.				
6.	Study of Flow over Round Crested Weir.				
7.	Study of Flow over Broad Crested Weir.				

8.	Study of Hydraulic Jump.
9.	Study of Specific Energy Curve diagram.
10.	Study of Turbines (Demonstration).
<p>General Instructions: Visit to Hydropower Plant. Assignments on each Theory Unit.</p>	
<p><i>Suggested Text Books/ Reference Books/Manual</i></p>	
1.	Modi/Seth, "Fluid Mechanics – Hydraulic and Hydraulic Mechanics", Standard Book House, Delhi
2.	A.K. Jain, "Fluid Mechanics", Khanna Pub., Delhi.
3.	S. Nagathanam, "Fluid Mechanics", Khanna Pub., Delhi
4.	Arora, "Fluid Mechanics".
5.	R.C.Hibbeler, "Fluid Mechanics", Pearson Publication.

Class, Part & Semester	:	Second Year B. Tech (Civil Engineering), Part II & Sem IV			
Course Title	:	Lab IV: Building Planning and Drawing	Course Code:	:	CEL 229
Teaching Scheme (Hours)	:	Practical :	4Hrs/week		Total Credits : 02
Evaluation Scheme (Marks)	:	IPE/IOE= 50/Nil	EPE/EOE= 50/Nil	Total=100	Duration of EPE : ----
Revision:	:	Second			Month : June 2021
Pre-requisites (if any)	:	ES-12A2, ES-11B2, ES-12A2, ES-11B2, CE213			
Course Domain	:	Core			
Course Rationale:					
The course basically focuses on planning and designing of residential building from conception stage to final drawing. Details of submission drawing are discussed and used widely. Implementation of Building planning by laws and regulations. Exercise of measured drawing is carried out in this course.					
Course Objectives: The Course teacher will			Course Outcomes: Students will be able to		
1.	To draw a submission drawing and design of residential building using the principles of planning and building byelaws.	1.	Prepare and draw submission drawing and design of residential building using the principles of planning and building byelaws.		
2.	To draw a working drawing plan for column and foundation details.	2.	Prepare and draw working drawing plan for column and foundation details.		
3.	To draw furniture layout, electrification layout and plumbing details of residential building and measured drawing plans.	3.	Prepare and draw furniture layout, electrification layout and plumbing details of residential building and prepare and draw measured drawing plans.		
4.	To learn drawing technique using Auto-Cad software and to draw submission drawing using Auto-Cad software.	4.	Use various auto - cad commands in preparing drawing and to draw submission drawing using Auto-Cad software		
List of Experiments/ Drawings					
Sr. No.					
1.	Full Imperial size sheet drawing based on actual measurements of existing residential building, consisting of plan, elevation, section passing through staircase and sanitary block, Site plan. Area statement and brief specifications, door -window schedule, septic tank details etc. Preparation of site visit report.				

2.	Planning and designing of residential building (G+1). Full set of drawings for the building planned (i) Municipal Submission drawing.
3.	(ii) Working Drawings: a) Foundation / Centre Line Drawing
4.	b) Furniture layout plan.
5.	c) Electrification plan
6.	d) Water supply and drainage plan.
7.	Project report giving details of following systems a) Stair Case design along with drawings with scale b) Drainage System c) Water Supply System d) Water Tank e) Septic Tank plan and section. f) Design of terrace Drainage System
8.	Assignment on Study of Auto CAD Commands
9.	Assignment on Preparation of 2D AutoCAD drawing of Project prepared in the practical work of subject Building Planning and drawing. Printing the drawing and enclosing for submission.
General Instructions: Site Visits along with curriculum to expose students to various aspects in relation to course contents and special site visit for measured drawing exercise. Preparation of visit report and assessment.	
<i>Suggested Text Books/ Reference Books/Manual</i>	
1.	V.B. Sikka, "A Course in Civil Engineering Drawing", S.K. Kataria and Sons .
2.	Shah, Kale, Patki, " Building Drawing", Tata McGraw- Hill
3.	Civil Engineering Drawing: Charusheela, M. S., Jamadar, Nirali Prakashan
4.	UDCPR , Urban Development Department , Government of Maharashtra

Class, Part & Semester	:	Second Year B. Tech (Civil Engineering), Part II & Sem IV			
Course Title	:	Environmental Studies		Course Code	: HS221
Teaching Scheme (Hours)	:	Lecture :	02 Hour/Week	Total Credits	:
		Tutorial :	00 Hours/Week		
Evaluation Scheme (Marks)	:	CIE = 00 SEE = 70	IPE=30 Project	Grand Total=100	Duration of SEE
					: 3 hrs. At the year end
Revision	:	Second		Month	: June 2021
Pre-requisites (if any)	:	HS211			
Course Domain	:	Ethics and Environment			
Course Rationale: The Course is all about learning the way we should live and how we can develop sustainable strategies to protect the environment. It helps individuals to develop an understanding of living and physical environment and how to resolve challenging environmental issues affecting nature.					
Course Objectives: The Course Teacher will			Course Outcomes: Students will be able to		
1.	Explain the types of environmental pollution.	1.	Identify the pollutants and respond to the pollution problem		
2.	Make the students recognize social issues and the environment connectivity with the same.	2.	Acquire knowledge of ecological threats and choose for sustainable developments.		
3.	Discuss various environmental Protection Acts reveal the students the importance of the same.	3.	Anticipate all these laws and follow the same for the care of the environment.		
4.	Explain the students to adapt to various environmental technologies.	4.	Apply their knowledge to implement pollution prevention measure through some practical work.		
Curriculum Content					Hours
Unit I Environmental pollution: Definition: Causes, effects and control measures of: a) Air pollution, b) Water pollution, c) Soil pollution, d) Marine pollution, e) Noise pollution, f) Thermal pollution, g) Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies Disaster management: Floods, earthquake, cyclone and landslides. Tsunami					06
Unit II Social issues and the environment : From Unsustainable to Sustainable development; Urban problems related to energy; Water conservation, rain water harvesting, watershed management; Resettlement and rehabilitation of people; its problems and concerns; Environmental ethics: Issue and possible solutions; Climate change, Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust; Wasteland reclamation; Consumerism and waste products.					08

<p>Unit III Environmental protection: Environment Protection Act.; Air (Prevention and Control of Pollution) Act.; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act; Population Growth and Human Health, Human Rights. ;Field Work- Visit to a local area to document environmental assets river/forest/grassland/hill/mountain or Visit to a local polluted site urban/rural/Industrial/Agricultural or Study of common plants, insects, birds or Study of simple ecosystems-ponds, river, hill slopes, etc.</p>	<p>06</p>
<p>Unit IV Project / Field work:</p>	<p>10</p>
<p><i>Suggested Text Books:</i></p>	
<p>1.</p>	<p>Agarwal, K. C. 2001, Environmental Biology, Nidi Publ. Ltd., Bikaner.</p>
<p>2.</p>	<p>Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad, 380013, India</p>
<p>3.</p>	<p>Brunner R. C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p</p>
<p><i>Suggested Reference Books:</i></p>	
<p>1.</p>	<p>Clark R. S., Marine Pollution, Clarendon Press Oxford (TB) Pg No. 6</p>
<p>2.</p>	<p>Cunningham, W. P. Cooper, T. H. Gorhani, E. & Hepworth, M. T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p</p>
<p>3.</p>	<p>De A. K., Environmental Chemistry, Wiley Eastern Ltd.</p>
<p>4.</p>	<p>Down to Earth, Centre for Science and Environment (R)</p>
<p>5.</p>	<p>Gleick, H., 1993, Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute. Oxford Univ. Press 473p</p>
<p>6.</p>	<p>Hawkins R. e., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)</p>
<p>7.</p>	<p>Heywood, V. H. & Watson, R. T. 1995, Global Biodiversity Assessment, Cambridge Univ. Press 1140p.</p>
<p>8.</p>	<p>Jadhav, H. & Bhosale, V. M. 1995, Environmental Protection and Laws, Himalaya Pub. House, Delhi, 284p.</p>
<p>9.</p>	<p>Mckinney, M. L. & Schoel. R. M. 1996, Environmental Science Systems & Solutions, Web enhanced edition</p>
<p>10.</p>	<p>Mhskar A. K., Matter Hazardous, Techno-Science Publications (TB)</p>
<p>11.</p>	<p>Miller T. G. Jr., Environmental Science, Wadsworth Publishing Co. (TB)</p>
<p>12.</p>	<p>Odum, E. P. 1971, Fundamentals of Ecology, W. B. Saunders Co. USA, 574p.</p>
<p>13.</p>	<p>Rao M. N. & Datta, A. K. 1987, Waste Water Treatment, Oxford & IBH Publ. Co. Pvt. Ltd.,</p>
<p>14.</p>	<p>Sharma B. K., 2001, Environmental Chemistry, Goel Publ. House, Meerut</p>
<p>15.</p>	<p>Survey of the Environment, The Hindu (M)</p>
<p>16.</p>	<p>Townsend C., Harper, J. and Michael Begon, Essentials of Ecology, Blackwell Science (TB)</p>
<p>17.</p>	<p>Trivedi R. K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media (R)</p>
<p>18.</p>	<p>Trivedi R. K. and P. K. Goel, Introduction to air pollution Techno-Science Publications (TB)</p>
<p>19.</p>	<p>Wagner K. D., 1998, Environmental Management, W. B. Saunders Co. Philadelphia, USA.</p>

Class, Part & Semester	:	Second Year B. Tech (Civil Engineering), Part II & Sem IV					
Course Title	:	Soft Skills Development			Course Code	:	HS222
Teaching Scheme (Hours)	:	2 Hours /Week= 2 x13= 26 hours			Total Credits	:	Nil
Evaluation Scheme (Marks)	:	Assignments	:	50	Written Test	:	25
	:	Viva voce	:	25	Grand Total	:	100
Duration of SEE	:	NA					
Revision	:	Second			Month	:	June 2021
Pre-requisites (if any)	:	H. S. C. Level English language competency					
Course Domain	:	Humanity and Arts					
Course Rationale: The course skills focus on who people are, as opposed to what they are trained in. These skills serve to represent learners' approach to life and work. The course develops interpersonal skills hardwired to an individual's personality, and such skills characterize how we interact with other people in the workplace. These skills are important because they enable students to adjust to the frustrations and challenges they will encounter in their adult life, as well as the demands of work. Mastering soft skills help students learn, live and work better.							
Course Assessment Method: The students will be given five assignments each for 10 marks. At the end of the course, there will be a written test of 25 marks and a viva voce of 25 marks. All these assessments will be for a total of 100 marks. Based on the marks obtained, they will be awarded with a grade similar to other credit courses. Though it is an audit course, obtaining passing grade is essential.							
Course Objectives: The Course Teacher will				Course Outcomes: Students will be able to			
1.	Illustrate the components of self-development and state the importance of career planning.	1.	Identify components of self-development and realize its importance in their career planning.				
2.	Define Communication and classify the same.	2.	Differentiate between different communication types and apply the same.				
3.	Explain behavioral skills, team skills and interpersonal skills.	3.	Acquire behavioral, team and interpersonal skills and display the same.				
4.	Classify documentation types and describe various types of report writing.	4.	Follow different document formats and acquire report and proposal writing skills.				
5.	Describe emotional intelligence and its role.	5.	Receive and respond to emotions with intelligence.				
6.	Paraphrase interview skills and demonstrate resume writing.	6.	Acquire interview skills and apply those when required.				
Curriculum Content						Hours	
Unit I						02	
Self Development							
Self-analysis, creativity, attitude, motivation, goal setting. Importance of career visioning and							

planning.	
Unit II Effective Communication Skills Importance of communication, Communication process, Elements of communication, Communication Types-verbal and non-verbal, objectives of communication. Business Communication, current English usage, debates, language games, situational dialogues, precise writing, essay writing, presentations.	06
Unit III Behavioral Skills: Psychological Tests: Aptitude and personality assessment, suggestions for improvement, Team Skills: Team building and leadership, evolution of groups into teams, group dynamics, emergence of leadership, intra-group dynamics, inter-group dynamics, conflict management, inter dependency, assessment of team-based projects, Time Management: Pareto's Principle, Parkinson's Laws, Murphy's Laws, Law of Clutter, prioritization, goal setting, effective time management, Interpersonal Skills: Negotiations, listening skills, social skills, assertive skills, cross-cultural communications, Leadership Skills: Concepts of leadership, leadership styles, insights from great leaders.	08
Unit IV Documentation Report writing-Formal report, study tour report, project report, Writing proposal-solicited proposals and unsolicited proposals.	03
Unit V Emotional Intelligence Emotional Brain, Nature of emotional intelligence, emotional intelligence applied windows of opportunity, emotional literacy.	04
Unit VI Interview Skills Importance of Interview Skills, Resume Building, Group discussion and personal interview, Psychometric Test, actual career planning.	03
Suggested Text Books:	
1.	Soft Skills, 2015, Career Development Centre, Green Pearl Publications.
Suggested Reference Books:	
1.	Seven Habits of Highly Effective Teens, Covey Sean, New York, Fireside Publishers, 1998.

2.	How to win Friends and Influence People, Carnegie Dale, New York: Simon & Schuster, 1998.
3.	I am ok, You are ok ,Thomas A Harris, New York-Harper and Row, 1972
4.	Emotional Intelligence, Daniel Goleman, Bantam Book, 2006
5.	Effective communication skill, MTD training &Ventus publishing ApS ISBN 978-87-7681-598-1.

Equivalence for the Subjects

OLD		NEW	
Semester III			
MA 211	Engineering Mathematics-III	MA 211	Engineering Mathematics-III
CE 211	Surveying	CE 211	Surveying
CE 212	Strength of Materials	CE 212	Strength of Materials
CE 213	Construction Technology	*CE 213	Building Construction
CE 214	Fluid Mechanics-I	CE 214	Fluid Mechanics-I
CEL 211	Lab-I Fluid Mechanics-I	CEL 215	Lab-I Fluid Mechanics-I
CEL 212	Lab-II Strength of Materials	CEL 216	Lab-II Strength of Materials
CEL 213	Lab-III Construction Technology	CEL 217	Lab-III Building Construction
CEL 214	Lab-IV Surveying	CEL 218	Lab-IV Surveying
HS 211	Introduction to Foreign Languages	HS 211	Introduction to Performing Arts
HS 222	Environmental Studies	HS 212	Environmental Studies
Semester IV			
CE 221	Theory of structures -I	CE 221	Theory of structures -I
CE 222	Engineering Geology	CE 225	Engineering Geology
CE 223	Fluid Mechanics II	CE 223	Fluid Mechanics II
CE 224	Concrete Technology	CE 222	Concrete Technology
*CE 225	Building Planning and Drawing	*CE 224	Building Planning and Drawing
CE 221	Lab-I Engineering Geology	CEL 227	Lab-I Engineering Geology
CE 222	Lab-II Fluid Mechanics-II	CEL 228	Lab-II Fluid Mechanics-II
CE 223	Lab-III Concrete Technology	CEL 226	Lab-III Concrete Technology
CE 224	Lab-IV Building Planning and Drawing	CEL 229	Lab-IV Building Planning and Drawing
HS 221	Introduction to Performing Arts	HS 222	Soft Skills development
HS 222	Environmental Studies	HS 221	Environmental Studies