BVV Sangha's

Basaveshwar Engineering College, Bagalkote

Department of Civil Engineering

III- Semester 2022-23 Admitted Batch Scheme and Syllabus

Sl. No.	Course			Teaching Department	Teaching hours and Scheme of Evaluation						
	Category	Code	Title		Lecture	Tutorial	Practical/ Drawing	CIE Marks	SEE Marks	Total Marks	Credits
					L	T	P				
1	BSC	22UMA301C	Numerical Techniques and Fourier Series	Mathematics	3	0	0	50	50	100	3
2	PCC	22UCV302C	Mechanics of Materials	Civil Engineering	3	0	0	50	50	100	3
3	PCC	22UCV303C	Fluid Mechanics & Hydraulics	Civil Engineering	3	0	0	50	50	100	3
4	PCC	22UCV304C	Concrete Technology	Civil Engineering	3	0	0	50	50	100	3
5	PCC	22UCV305C	Building Materials and Construction Technology	Civil Engineering	2	0	0	50	50	100	2
6	IPCC	22UCV306C	Engineering Geology	Civil Engineering	1	0	2	50	50	100	2
7	AEC	22UCV307C	Building Planning and drawing using Auto Cad	Civil Engineering	2	0	2	50	50	100	3
8	PCC	22UCV308L	Basic materials and concrete testing lab	Civil Engineering	0	0	2	50	50	100	1
9	BSC		Bridge Course Mathematics-I	Mathematics	3	0	0	50	50	100	0
10	MC	22UHS001M/ 22UHS002M 22UHS003M	NSS/Yoga/PE	Humanities	-	-	-				0
					20	**0**	**6**	**450**	**450**	**900**	**20**

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22UMA302C	COMPLEX ANALYSIS AND INTEGRAL TRANSFORMS	03 - Credits (3 : 0 : 0)
Hours / Week : 03		CIE Marks : 50
Total Hours : 40		SEE Marks : 50

UNIT – I Complex Variables	10 Hrs.
Analytic function, Cauchy-Riemann equations in Cartesian and polar forms. Construction of analytic function (Cartesian and polar forms), Discussion of conformal transformations: z^2, e^z and $z + a^2/z$ *(z # 0)*, Bilinear transformations. **(RBT Levels: L1, L2 and L3)**	
UNIT – II Complex Integration	**10 Hrs.**
Complex Integration: Line integral, Cauchy's theorem – corollaries(without proof), Cauchy's integral formula. Taylor's and Laurent's series (statements only), singularities, poles, calculation of residues, Cauchy's residue theorem (without proof) - problems. **(RBT Levels: L1, L2 and L3)**	
UNIT – III Fourier series	**10 Hrs.**
Periodic functions, Conditions for Fourier series expansions, Fourier series expansion of continuous and functions having finite number of discontinuities, even and odd functions. Half-range series, practical harmonic analysis. **(RBT Levels: L1, L2 and L3)**	
UNIT – IV Fourier transforms	**10 Hrs.**
Infinite Fourier transforms and inverse Fourier transforms- simple properties, Fourier sine and Fourier cosine transforms. Inverse Fourier sine and cosine transforms. **(RBT Levels: L1, L2 and L3)**	

References:

1. Numerical Methods for Engineers by Steven C Chapra &Raymond P Canale.
2. Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers, New Delhi.
3. Advanced Engineering Mathematics By H. K. Das, S. Chand & company Ltd. Ram Nagar, New Delhi
4. Advanced Engineering Mathematics by E Kreyszig , John Wiley & Sons.

Learning Objectives:

1. Exploring various applications of complex variables in engineering fields.
2. Learning Cauchy-Riemann equations and their role in determining the differentiability of complex functions.
3. Understanding contour integration and its applications in evaluating complex integrals, including, Cauchy's integral theorem, and Cauchy's integral formula.
4. To provide a way, to represent periodic functions in terms of simple trigonometric functions.
5. To transform a function from the time domain to the frequency domain.

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Course Outcomes:

After completion of the course the students shall be able to,

1. Learn about analytic functions and the concept of complex differentiability, including Cauchy–Riemann equations and be able to determine if a function is analytic.
2. Understand the principles of Contour integration and be able to evaluate complex integrals using various techniques such as the Cauchy's integral theorem and the residue theorem. .
3. Grasp the concept of representing periodic functions as an infinite sum sinusoidal (sine and cosine) with different frequencies.
4. Grasp the concept of the Fourier transform as a mathematical tool that converts a function from the time domain into the frequency domain.

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22UCV302C	**MECHANICS OF MATERIALS**	Credits: 3
L:T:P - 3 : 0 : 0		CIE Marks: 50
Total Hours/Week: 3		SEE Marks: 50

UNIT-I	**12 Hrs.**

Simple Stresses and Strain: Introduction, Definition and concept and of stress and strain. Hooke's law, Stress-Strain diagrams for ferrous and non-ferrous materials, factor of safety, Principle of superposition, Elongation of uniform bars, stepped bars and composite bars and Numerical examples.

UNIT–II	**10 Hrs.**

Relation amongst elastic constants and volumetric strain: Elastic constants. Relationship amongst E and G, Relation amongst E and K, Volumetric strain, expression for volumetric strain and Numerical examples.

Compound Stresses: Introduction, state of stress at a point, General two dimensional stress system, principal planes and Principal stresses. Maximum Shear stresses and Maximum Principal stresses and Numerical examples.

UNIT–III	**10 Hrs.**

Shear Force and Bending Moment in Beams: Introduction to types of beams, supports and loadings. Definition of bending moment and shear force, Sign conventions, relationship between load intensity, bending moment and shear force. Shear force and bending moment diagrams for statically determinate beams subjected to points load, uniformly distributed loads, uniformly varying loads, couple and their combination

Columns and struts: Introduction, Euler's theory for long columns, Effective length, slenderness ratio, Short and long columns, radius of gyration, buckling load, Assumptions, derivations of Euler's Buckling load for columns for different end conditions, Limitations of Euler's theory, Rankin's formula.

UNIT–IV	**10 Hrs.**

Bending stresses and shear stresses in beams: Review of Internal forces in beams, SF, BM, SFD and BMD. Introduction to bending stress in beam. Assumptions in simple bending theory, Pure bending, and derivation of Eulers Bernoulli's beam equation. Section modulus, Flexural rigidity, Beam of uniform strength. Introduction to shear stress in beam. Expression for horizontal shear stress in beam. Shear stress diagrams for rectangular, symmetrical I and T sections. Numerical problems.

Reference Books

1. B. C. Punmia, Ashok Jain, Aran Jain, Mechanics of Materials, Lakshmi Publications, New Delhi, Revised edition.2017.
2. Basavarajaiah and Mahadevappa, Strength of Materials, Publishers, University press, Hyderabad India 3rd Edition 2010.
3. S.S.Bhavikatti, Strength of Materials, 2nd Edition Vikas Publications, New Delhi 2006. 4. R. Subramanian, Strength of Materias, Oxford University Press 3rd edition 2016.
4. Beer and Johnson, Mechanics of Materials, McGraw hill Publications,
5. R. C. Hibbeler, Mechanics of Materials, Pearson Publications.

Course Outcomes (Students will be able to…)

1. Evaluate the basic concepts of the stresses and strains for different materials and strength of structural elements subjected to axial and temperature stresses.
2. Evaluate the development of internal forces and resistance mechanism for one dimensional and two-dimensional structural elements.
3. Draw bending and shear stress distribution diagrams for beams of various cross sections and for various loads.
4. Determine slope and deflection for statically determinate beams and buckling loads for columns.

COs	Programme Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1.0	2.0		2.0		1.0				1.0			2.0		
CO2		2.0		2.0		3.0							2.0		
CO3			3.0				3.0						2.0		
CO4			3.0	3.0	3.0			3.0					2.0		
Average	0.3	1.0	1.5	1.0	0.8	1.0	0.8	0.8		0.3			2.0		

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22UCV303C	**FLUID MECHANICS AND HYDRAULICS**	Credits: 3
L:T:P - 3 : 0 : 0		CIE Marks: 50
Total Hours/Week: 3		SEE Marks: 50

UNIT-I	**10 Hrs.**

Properties of fluids: Density, Specific volume, specific weight, Relative density, and viscosity. Surface tension and Capillarity, Newton's law of viscosity, **Types of fluids:** Newtonian & Non-Newtonian fluids, Ideal and Real fluids, Newton's law of viscosity.

Fluid pressure and its measurement: Derivation of Pascal's law, and Hydrostatic law. Numericals. Types of pressure. Manometers and their classification, theory, derivation and numerical problems, Mechanical pressure gauges and Bourdon's pressure gauge.

UNIT–II	**10 Hrs.**

Fluid statics: Definition of Total pressure, Centre of pressure, Derivation of total hydrostatic force and depth of center of pressure on a plane surface (horizontal, vertical, inclined, curved) and Numerical Problems.

Fluid kinematics: Lagrangian and Eulenian approaches of fluid flow analysis, Classification of flows. Continuity equation, Derivation of Continuity equation in three dimensions, Numerical Problems. Velocity and Acceleration in 3D. Definition and properties of velocity potential function and stream functions, streamline & equipotential line, and relation between them. Numerical Problems.

UNIT–III	**10Hrs.**

Fluid dynamics: Derivation of Euler's equation and Bernoulli's equation for ideal & real fluids with assumptions and limitations. Problems on Bernoulli's equation Application of Bernoulli's equation to pitot tube and venturi-meter and Numerical Problems.

Dimensional Analysis: Raleigh's methods and Buckingham methods

Pipe flow: Definition, Classification of flows, HGL and TEL, major and minor losses in pipe flows. Derivation of equation for head loss due to friction (Darcy-Weisbach equation). Problems on major and minor head losses and compound pipes. Water Hammer in Pipes: Derivation for pressure rise due to gradual and sudden closure of valve and numerical problems.

UNIT–IV	**10 Hrs.**

Open channel flow: Definition and classification, Derivation of Chezy's and Manning's equations and Numerical Problems. Most economical rectangular, trapezoidal, and circular channel sections: Derivations and numerical problems.

Specific energy: Specific energy curve, Derivation of critical depth, critical velocity, and minimum specific energy, Numerical problems. Froude's number and its significance.

Notches and Weirs: Classification of notches and weirs, derivation of discharge equation through rectangular, triangular, trapezoidal section and numerical problems. Hydraulic Coefficients, Weirs: Ogee and Broad crested

Hydraulic Machines: Impact of jet, Pumps and Turbines (Classification and working principle)

Reference Books *

1. James F Cruise, Vijay P. Singh, Elementary Hydraulics (1stEdition), Mohsan M. Sherif, Thomson Learning. April 2006.
2. K. R. Arora Fluid Mechanics, Hydraulic and Hydraulics, Standard Book House, NewDelhi-2007.
3. John F. Douglas Fluid Mechanics. Pearson Education New Delhi, 2011.
4. V. L. Streeter & B. Wylie Fluid Mechanics Lakshmi Publications, New Delhi, 2007.
5. H. M. Raghunath Fluid Mechanics CBS Publication New Delhi. 2008.
6. M. Manohar, Fluid Mechanics. Vol-I Vikas Publishing house Pvt Ltd New Delhi, 2008.

Course Outcomes (Students will be able to**

1. Demonstrate a comprehensive understanding of fluid properties, including measuring density, viscosity, surface tension, and pressure. They will differentiate between Newtonian and non-Newtonian fluids and apply their knowledge to solve numerical problems utilizing manometers and pressure gauges.
2. Analyze fluid statics, including hydrostatic forces and center of pressure, and apply fluid kinematics principles, including continuity equations and velocity potential functions, to solve numerical problems in fluid mechanics.
3. Apply fluid dynamics, including Euler's and Bernoulli's equations, and apply them to solve problems in pipe flow, head losses, and water hammer phenomena.
4. Apply the concept of open channel flow, including Chezy's and Manning's equations, economical channel sections, specific energy, Froude's number, hydraulic jumps, and discharge equations for notches and weirs through derivations and numerical problem-solving.

COs	**Programme Outcomes (POs)**												**PSOs**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO1	2	2										2			2.0
CO2	2	2										2			2.0
CO3	2	2	2									2			2.0
CO4	2	2										2			2.0
Average	2.0	2.0	2.0									2.0			2

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22UCV304C	**CONCRETE TECHNOLOGY**	Credits: 3
L:T:P - 3 : 0 : 0		CIE Marks: 50
Total Hours/Week: 3		SEE Marks: 50

UNIT-I	**10 Hrs.**

Cement and Aggregates:

Cement

Cement, Chemical Composition, Hydration of Cement. Types of cement, Manufacture of cement, Testing of cement - Field testing. Fineness by Sieve test and Blaine's air permeability test, Normal consistency test, Setting time test and Soundness test.

Fine aggregates-Grading of aggregates, Specific gravity, Bulking, Moisture content and Deleterious materials.

Coarse aggregates - Importance of size, shape and texture. Grading of aggregates, Sieve analysis, and Specific gravity. Flakiness and Elongation index. Crushing, Impact and Abrasion tests.

UNIT–II	**10 Hrs.**

Fresh Concrete Properties

Workability - Factors affecting workability, Measurement of workability –Slump Test, Flow test, Compacting Factor Test and Vee-bee Consistometer Test. Segregation and Bleeding. Manufacturing process of concrete - Batching, mixing, transporting, placing, compaction and curing.

UNIT–III	**10Hrs.**

Admixtures- Chemical admixtures -plasticizers, accelerators, retarders and air entraining agents. Mineral admixtures- Fly ash, silica fume and rice husk ash. Water proofing compounds.

Hardened Concrete Properties: Testing of hardened concrete - Compressive strength, Split tensile strength and Flexural Strength test. Factors affecting strength. w/c ratio, aggregate properties. Relation between Compressive strength and Tensile strength, Bond strength, Modulus of rupture and Elasticity.

UNIT–IV	**10 Hrs.**

Durability - Definition, Factors affecting, environmental exposure conditions, Permeability – Definition, factors affecting permeability. Shrinkage, factors affecting shrinkage; Creep - factors affecting creep, effect of creep.

Concrete Mix Design

Concept of mix design, variables in proportioning, exposure conditions. Procedure of mix design as per latest IS 10262:2019.Numerical examples of mix design on mix design for OPC concrete mixes and Fly ash concrete mixes.

Reference Books *

1. M.S.Shetty Concrete Technology Theory and Practice, S.Chand and Co, New Delhi, 2002.
2. Neivelle A.M and Brooks, Concrete Technology,J.J ELBS Edition, London Delhi, 4th Edition, 2004.
3. P.Kumar Mehta & Paul J.M, Concrete Technology, Monterio Indian Concrete Institute USA-1999
4. IS 10262:2019 for concrete mix design.

5. A.R. SanthaKumar, "Concrete Technology", Oxford University Press, New Delhi (New Edition).
6. M.L. Gambhir, "Concrete Technology", McGraw Hill Education, 2014.
7. N.V. Nayak, A.K. Jain Handbook on advanced Concrete Technology, ISBN: 978-81-8487-186-9

Course Outcomes (Students will be able to…)**

1. Manufacture of Cement, types of cement, Chemical composition, Hydration of cement and tests on cement. Importance of size, shape and texture of aggregates. Grading of aggregates. Tests on aggregates.
2. Fresh Concrete:
   Workability, Measurement of workability Segregation and Bleeding. Manufacturing process of concrete.
3. Chemical and Mineral admixtures.
   Evaluate the testing procedure for hardened concrete to assess its hardened properties.
4. Durability of concrete
   Concrete Mix Design: Concept of mix design, Procedure of mix design as per IS 10262-2019, Numerical examples of mix design.

COs	Programme Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1					2						2	2.0		2.0
CO2	1					1						2	2.0		2.0
CO3	1											2	2.0		2.0
CO4	1					2		3				2	2.0		2.0
Average	1.0					1.7		3.0				2.0	2.0		

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22UCV305C	**BUILDING MATERIALS AND CONSTRUCTION TECHNOLOGY**	**Credits: 2**
L:T:P - 2 : 0: 0		CIE Marks: 50
Total Hours/Week: 2		SEE Marks: 50

UNIT-I	**05 Hrs.**

Building materials: Bricks: Classification of bricks, Tests on bricks.

Other Building Materials: Reinforcing steel, Structural steel.

Foundations: Safe bearing capacity of soil, Plate load test, Classification of foundations, introduction to spread, combined, strap, mat and pile foundation.

UNIT–II	**06 Hrs.**

Masonry: Definition of terms used in masonry, Types of bonds in brickwork, Coursed and Uncoursed rubble masonry, Ashlar masonry.

Stairs, doors, windows, and ventilators: Technical terms in stairs, Requirements of a good stair, Geometric design of RCC dog legged and open well stairs (plan and sectional elevation of stairs),

Doors: Different types of doors, Windows, and Ventilators.

UNIT–III	**06 Hrs.**

Floors: Types of flooring (Materials and methods of laying): Granolithic, Ceramic, Marble, Polished Granite flooring

Roofs: Flat Roof (R.C. Flat terraced roofing), Lean to roof, Wooden truss (King post and Queen post truss).

Miscellaneous: Shoring, Scaffolding, Damp proof course, Plumbing, Form work

UNIT–IV	**06 Hrs.**

Arch, Lintel, Chejja: Classification of arches and Lintels: Types and classifications, Chejja, Functions.

Plastering and painting: Purpose of plastering, Materials used for plastering, Lime mortar, Cement Mortar, Methods of plastering, Purpose of Painting, Application of paints to new and old surfaces, Distemper, Plastic emulsion, Enamel Powder coated painting to walls and steel surfaces, Polishing of wood surface.

Reference Books *

1. Punmia B.C Laxmi Building Construction Pubications Pvt Ltd New Delhi 2008
2. S.C Rangalwala, Building Construction, Character Publishing House, Anand India25th2007.
3. Sushil Kumar, Building Construction, Standard Publisher,NewDelhi2008
4. Rangawala P. C Engineering Materials, Chapter Publishing house, Anand India-2014
5. Sushil Kumar, Engineering Materials, Standard Publication and Distributors, New Delhi

Course Outcomes**

After completion of the course student will be able to:

1. Assess the quality of building materials, describe the method of finding SBC of soil and evaluate the suitability of different foundations for different soil conditions.
2. Classify and describe different types of masonry, design (geometric) doglegged staircase, assessing the suitability of a staircase and classify different doors and windows for buildings.
3. Classify different types of floors and roofs. Understand the miscellaneous engineering works like Shoring, Scaffolding, Damp proof course, Plumbing, Form work
4. Compare types of lintels, chajja and arches, describe method of construction and method of plastering and application of paints and finishes for different surfaces.

COs	Programme Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3.0	3.0											2.0		
CO2	3.0	3.0											2.0		
CO3	3.0	3.0	3.0	3.0									2.0		
CO4	3.0			2.0									2.0		
Average	3.0	3.0	3.0	2.5									2.5		

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22UCV306C	**ENGINEERING GEOLOGY**	**Credits: 2**
L:T:P - 1 : 0: 2		CIEMarks:50
Total Hours/Week: 3		SEEMarks:50

UNIT-I	**04 Hrs.**
Introduction: Geology- its branches; Engineering geology, scope of geology in civil engineering; Work activities of engineering geologist **Mineralogy:** Definition, importance and general classification of minerals; Study of physical properties, chemical composition and uses of common rock forming and ore forming minerals; Stability of the minerals	
UNIT-II	**04 Hrs**
Petrology: Introduction, definitions and general classification of rocks; Rock cycle; Mode of occurrence, structures, textures, classification, descriptions and engineering usage of important igneous, sedimentary and metamorphic rocks. **Physical Geology:** Epigene and hypogene geological agents; Weathering of rocks, types of weathering; Significance of Weathering in Civil Engineering. Soil – its formation, profile, classification, erosion and conservation. Earthquakes - Causes and effects, plate tectonics and elastic rebound theory. Landslides: Causes, effects and preventive measures.	
UNIT-III	**04 Hrs.**
Structural Geology: Basic definitions - outcrop, inlier, outlier, dip and strike; Use of Clinometer compass and Brunton compass. Study of important Geological structures- Faults, Folds, Joints and Unconformities - definition, classification, recognition in the field and significance in civil engineering. Selection of sites for civil engineering projects - dams, reservoirs and tunnels.	
UNIT–IV	**04 Hrs.**
Hydrogeology: Hydrological cycle, mode of occurrence and sources of groundwater; Water bearing properties of rocks and soils; Aquifers and their types. Influence of groundwater in engineering construction; groundwater exploration by geophysical method; Artificial recharge of groundwater	

ENGINEERING GEOLOGY LAB (Integrated)

LIST OF EXPERIMENTS

1	Megascopic Identification of Minerals based on their Physical properties; Quartz and its varieties.
2	Megascopic Identification of Minerals based on their Physical properties; Felspars, Micas, Hornblende, Olivine, Serpentine, Asbestos, Kyanite, Talc, Garnet, Corundumand Barite.
3	Megascopic Identification of Minerals based on their Physical properties Carbonates and Ore minerals.
4	Megascopic Identification of Igneous Rocks based on Geological Properties- Granite, Syenite, Diorite, Gabbro, Dunite, Porphyries, Dolerite, Pegmatite, Basalt and Pumice.
5	Megascopic Identification of Sedimentary Rocks based on Geological Properties- Sand Stone, Lime Stone, Shale, Breccia, Conglomerate and Laterite.
6	Megascopic Identification of Metamorphic Rocks based on Geological Properties-Gneiss, Quartzite, Marble, Slate, Phyllite, Schist and Charnockite.

7	Study and interpretation of standard geological maps.
8	Dip and Strike problems.
9	Borehole Problems (On Level Ground).
10	Thickness Problems.

Reference Books *

1. Parbin Singh, 2008,A **Text book of Engineering & General Geology**; S.K Kataria & Sons, 8th Revised Edn. New Delhi.
2. Santoshkumar Garg,1999, **Physical and Engineering Geology;** Khanna Publishers,3rd revised and enlarged Edn New Delhi.
3. P.KMukerjee, 1990,A **Text book of Geology;** The World Press, 11th reviser Edn .Pvt Ltd Calcutta.
4. K.M.Bangar**, 2004, Principles of Engineering Geology;** Standard Publishers and Distributors, New Delhi.
5. D. Venkat Reddy, 1997, **Engineering Geology for Civil Engineers;** Oxford& IBH Publishers, New Delhi.
6. N.Chennakesavalu,2009,**Text Book of Engineering Geology**; Macmillan Publishers2ndEdn India Ltd. New Delhi.
7. Vasudev Kanithi,2018,**Engineering Geology**; Universities Press (India) Pvt. Ltd. Hyderabad.
8. Subinoy Gangopadhyay,2013, **Engineering Geology**; Oxford Universities Press New Delhi.
9. F.G.H. Blyth, M.H. de Freitas,1988, **Geology for Engineers**; Elsevier publications7thEdn 1
10. KVGK Gokhale , **Principles of Engineering Geology**; B S Publications, Hyderabad.
11. H.H.Read,1984, **Rutley's, Elements of Mineralogy ;** CBS Publishers &Distributors,New Delhi.
12. G.W.Tyrrel,1987,**Principles of Petrology;** BI Publications PvtLtd,New Delhi.
13. S.K. Duggal, H.K.Pandey, N.Rawal, - **Engineering Geology**, Mc Graw Hill Education publications 2017

REFERENCE BOOKS for LAB:

1	B.S.Satyanarayanswamy,2003,EngineeringGeologylabManual,Eurasia Publication,NewDelhi.
2	M.T.MarutheshaReddy,2002,EngineeringGeologyPracticals,NewAge InternationalPvt Ltd ,1stEdn, New Delhi.
3	N.W.Gokhale,1987,Manual of Geological Maps, CBS Publishers & Distributors, 1stEdn, New Delhi.
4	N.W. Gokhale,1996, Exercises on geological Maps & Dip-Strike Problems,CBS Publishers &Distributors, 1stEdn, New Delhi.
5	N.W.Gokhale,2001,AGuide to Field Geology, CBS Publishers & Distributors, 1stEdn.New Delhi.

Course Outcomes**

After completion of the course student will develop competencies in:

1. Realize the importance of geological studies for safe, stable, and economic design of any Civil Engineering Structures.
2. Get the basic knowledge and effective usage of earth's materials (Mineral & Rocks) in different Civil Engineering Projects
3. Understand the significance of weathering, geological structures (Bedding planes, faults, folds, joints, unconformities, etc) Natural Hazards (Earthquakes and Landslides) in selection of sites for dams and tunnels.
4. Know about the importance of groundwater, its occurrence, exploration and artificial recharge methods.

COs	**Programme Outcomes (POs)**												**PSOs**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO1	3.0	3.0	2.0	-	2.0	2.0	-	-	-	-	-	-		1.0	
CO2	3.0	2.0	3.0	-	2.0	1.0	-	-	-	-	-	-		1.0	
CO3	3.0	2.0	3.0	-	3.0	-	-	-	1.0	-	-	-		1.0	
CO4	2.0	1.0	1.0	-	2.0	1.0	-	-	1.0	-	-	1.0		1.0	
Average	2.8	2.0	2.3		2.3	1.3			1.0			1.0		1.0	

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22UCV307C	**BUILDING PLANNING AND DRAWING USING AUTO CAD**	Credits: 3
L:T:P - 2 : 0 : 2		CIE Marks: 50
Total Hours/Week: 4		SEE Marks: 50

UNIT-I	**6 Hrs.**
Drawing Basics: Selection of scales for various drawings, thickness of lines, dimensioning, abbreviations and conventional representations as per IS: 962. Simple engineering drawings with CAD drawing tools : Lines, Circle, Arc, Poly line, Multiline, Polygon, Rectangle, Spline, Ellipse, Modify tools: Erase, Copy, Mirror, Offset, Array, Move, Rotate, Scale, Stretch, Lengthen, Trim, Extend, Break, Chamfer and Fillet, Using Text: Single line text, Multiline text, Spelling, Edit text, Special Features: View tools, Layers concept, Dimension tools, Hatching, Customizing toolbars, Working with multiple drawings.	
UNIT–II	**6 Hrs.**
Functional design of buildings: Principles of planning, planning regulations and building bye-laws, factors affecting site selection, Functional planning of residential and public buildings, design aspects for different public buildings. Recommendations of NBC.	
UNIT–III	**14 Hrs.**
Working drawings for various components of building.: Following drawings are to be prepared for the data given using CAD Software 1. Cross section of stepped wall Foundation, masonry wall. 2. Cross section of masonry wall for one story and two stories. 3. Isolated RCC column footings. 4. Different types of staircases – Dog legged, Open well.	
UNIT–IV	**14 Hrs.**
Drawing of Plan, elevation and sectional elevation using CAD software for: 1. Single Storied Building with one bedroom 2. Single Storied Building with two bedroom. 3. Two Storied Building **Draw the line diagram using CAD software for:** 1. Primary health center. 2. Primary school building. 3. PWD EE office 4. Tahshildar Office 5. PWD Sub-division office	

Reference Books *

1. Shah.M.H and Kale CM, Building Drawing, Tata Mc Graw Hill Publishing co Ltd., New Delhi,4th Edi, 2008.
2. Gurucharan Singh, Building Construction, Standard Publishers &distributors,New Delhi, 4thEdn. 1989.
3. Sushil Kumar, Building Construction, Standard Publications, New Delhi, 19th Edn. May 2018National Building Code, BIS, New Delhi, Dec 1986.

Course Outcomes**

1. To understand the basic concept on Auto Cad software tools.
2. Prepare, read and interpret the drawings in a professional set up.
3. To execute the Drawing of different Elements of the Building.
4. Prepare the Plan, Elevation, cross section and line diagram for residential and public buildings.

COs	Programme Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1.0	2.0		2.0		1.0				1.0			2.0		
CO2		2.0		2.0		3.0							2.0		
CO3			3.0				3.0						2.0		
CO4			3.0	3.0	3.0			3.0					2.0		
Average	1.0	2.0	3.0		3.0	2.0							2.0		

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22UCV308L	**BASIC MATERIALS AND CONCRETE TESTING LAB**	Credits: 1
L:T:P - 0 : 0 : 2		CIE Marks: 50
Total Hours/Week: 2		SEE Marks: 50

List of experiments

1. Tension test on mild steel and HYSD bars.
2. Compression test on Wood.
3. Torsion test on mild steel circular sections.
4. Bending test on Wood specimen two-point loading.
5. Tests on bricks.
6. Cement: Normal consistency, setting time, soundness by Le chateliers apparatus, Compression strength test and sieve method for fineness of cement and Specific gravity of cement.
7. Fresh concrete: Workability-Slump, Compaction factor and Vee Bee test.
8. Hardened concrete: Compression strength test, Split tensile test.

Reference Books *

1. Davis, Troxell and Hawk, Testing of Engineering Materials, International Student Edition McGraw Hill Book Co. New Delhi.1982
2. Fenner, Mechanical Testing of Materials, George Newnes Ltd. London.1965
3. Holes KA, English, Experimental Strength of Materials, Universities Press Ltd. London 2010
4. Suryanarayana AK, Testing of Metallic Materials, Prentice Hall of India Pvt. Ltd. New Delhi. 2007
5. Methods of test for determination of strength properties of natural building stone. IS 1121-1, 1974.
6. Kukreja CB, Kishore K. Ravi Chawla, Material Testing Laboratory Manual, Standard Publishers & Distributors 1996.
7. M.L. Gambhir, Concrete Manual, Dhanpat Rai & Sons – New Delhi 2004.

Course Outcomes** (Students will be able to

1. Analyze the response of a solid material to different forces (such as Compressive, Tensile, Shear, Flexure, and Torque) and determine the resulting stresses and corresponding strain.
2. Investigate the effects of Torque and internal fluid pressure on a solid material and calculate the resulting stresses and corresponding strain.
3. Assess and analyze the mechanical properties of different materials under varying loading conditions.

COs	**Programme Outcomes (POs)**												**PSOs**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO1	1	1							2	2		2	2		
CO2	1	1							2	2		2	2		
CO3	1	1							2	2		2	2		
Average	1	1							2	2		2	2		

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IV- Semester 2022-23 Admitted Batch Scheme and Syllabus

Sl. No.	Course			Teaching Department	Teaching hours and Scheme of Evaluation						
	Category	Code	Title		Lecture	Tutorial	Practical/ Drawing	CIE Marks	SEE Marks	Total Marks	Credits
					L	T	P				
1.	BSC	22UMA401C	Partial Deferential Equations & Statistics	Mathematics	3	0	0	50	50	100	3
2.	PCC	22UCV402C	Analysis of Statically Determinate Structures	Civil Engineering	3	0	0	50	50	100	3
3.	PCC	22UCV403C	Soil Mechanics	Civil Engineering	3	0	0	50	50	100	3
4.	PCC	22UCV404C	Transportation Engineering	Civil Engineering	4	0	0	50	50	100	4
5.	IPCC	22UCV405C	Surveying	Civil Engineering	3	0	2	50	50	100	4
6.	PCC	22UCV406L	Fluid Mechanics Lab	Civil Engineering	0	0	2	50	50	100	1
7.	PCC	22UCV407L	Geotechnical Engineering lab	Civil Engineering	0	0	2	50	50	100	1
8.	HSMC	22UHS424C	UHV - II	Humanities/Civil Engg.	1	0	0	50	50	100	1
9	BSC		Bridge Course Mathematics-I	Mathematics	3	0	0	50	50	100	0
10	MC	22UHS001M/ 22UHS002M 22UHS003M	NSS/Yoga/PE	Humanities	-	-	-				0
					20	**0**	**6**	**450**	**450**	**900**	**20**

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22UMA402C	Statistics and Probability Theory	03 - Credits (3 : 0 : 0)
Hours / Week : 03		CIE Marks : 50
Total Hours : 40		SEE Marks : 50

UNIT – I Statistics and Probability	10 Hrs.
Curve fitting by the method of least squares: $y = a + bx$, $y = ab^x$ and $y = a + bx + cx^2$ Correlation and regression. Probability: addition rule, conditional probability, multiplication rule, Baye's rule. **(RBT Levels: L1, L2 and L3)**	
UNIT – II Probability distributions	**10 Hrs.**
Random variables, Problems on expectation and variance. Binomial distributions Poisson distributions and Normal distributions. **(RBT Levels: L1, L2 and L3)**	
UNIT – III Joint Probability distributions & Markov chains	**10 Hrs.**
Concept of joint probability, Joint distributions - discrete random variables. Introduction, Probability vectors, Stochastic Matrices, Fixed Points and Regular stochastic Matrices, Markov chains, higher transition probabilities, stationary distribution of regular Markov chains and absorbing states. **(RBT Levels: L1, L2 and L3)**	
UNIT – IV Calculus of Variations	**10 Hrs.**
Variation of a function and a functional, extremal of a functional, variational problems, Euler's equation, standard variational problems including geodesics, minimal surface of revolution, hanging chain and Brachistochrone problems. **(RBT Levels: L1, L2 and L3)**	

References:

5. Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers, New Delhi.
6. Advanced Engineering Mathematics By H. K. Das, S. Chand & company Ltd. Ram Nagar, New Delhi
7. Advanced Engineering Mathematics by E Kreyszig ,John Wiley & Sons**.**
8. Probability and stochastic processes by Roy D. Yates and David J. Goodman, wiley India pvt.ltd 2nd edition 2012.
9. Theory and problems of probability by Seymour Lipschutz (Schaum's Series).

Learning Objectives:

1. To apply the knowledge of Statistics in various Engineering fields
2. To acquire knowledge about predictions preferably on the basis of mathematical equations.
3. To understand the principal concepts about probability.

Course Outcomes:

After completion of the course the students shall be able to,

5. Apply the least square sense method to construct the specific relation for the given group of data.
6. Solve problems on correlation and regression
7. Apply the concepts of probability and distributions
8. Apply the concept of Markov Chain for commercial and industry purpose.

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22UCV402C	**ANALYSIS OF DETERMINATE STRUCTURES**	Credits: 3
L:T:P - 3 : 0 : 0		CIE Marks: 50
Total Hours/Week: 3		SEE Marks: 50

UNIT-I	**10 Hrs.**
Introduction and Analysis of Plane Trusses: Structural forms, Conditions of equilibrium, Compatibility conditions, Degree of freedom, Linear and nonlinear analysis, Static and kinematic indeterminacies of structural systems. **Arches and Cable Structures:** Three hinged parabolic arches with supports at the same and different levels. Determination of normal thrust, radial shear and bending moment. **Analysis of cables** under point loads and UDL. Length of cables for supports at same and at different levels.	
UNIT–II	**10 Hrs.**
Deflection of Beams: Definition of slope, Deflection and curvature, Sign conventions, Review of moment-curvature equation. **Moment area method:** Derivation, Mohr's theorems, Sign conventions, Application of moment area method for determinate prismatic beams, Beams of varying section, Use of moment diagram by parts. **Conjugate beam method**: Real beam and conjugate beam, conjugate beam theorems, Application of conjugate beam method of determinate beams of variable cross sections.	
UNIT–III	**8 Hrs.**
Energy Principles and Energy Theorems: Principle of virtual displacements, Principle of virtual forces, Strain energy and complimentary energy, Strain energy due to axial force, bending, shear and torsion, Deflection of determinate beams and trusses using total strain energy, Deflection at the point of application of single load, Castiglione's first theorem and its application to estimate the deflections of trusses, Special applications- unit load method for beams and frames.	
UNIT–IV	**12 Hrs.**
Influence Lines and Moving Loads: Concepts of influence lines-ILD for reactions, SF and BM for determinate beams-ILD for axial forces in determinate trusses Reactions, BM and SF in determinate beams using rolling loads concepts.	
Reference Books *	
B C Punmia, Ashok Kumar Jain, Aran Kumar Jain Theory of structures Vol-I & II Laxmi Publications, New Delhi-2004 C S Reddy-Basic Structural Analysis, 2 Edition, Tata Mc Graw Hill, New Delhi-2003. Ramamrutham, R Narayan-Theory of structures,Dhanpt Rai Publishing Company,8 Edition New Delhi-2008 Hibbeler R C, Structural Analysis, Prentice Hall, 9th edition, 2014 0. Devadoss Menon, Structural Analysis, Narosa Publishing House, New Delhi, 2008. 1. Prakash Rao D S, Structural Analysis, University Press Pvt. Ltd, 2007.	

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Course Outcomes**

1. Understand the basic concepts associated with structural systems. Determine the stress resultants in arches and cables.
2. Evaluate the slopes and deflections for statically determinate beams and trusses by moment–area and conjugate beam method.
3. Understand the energy principles and energy theorems and its applications to determine the deflections of beams, trusses and frames.
4. Understand the basic concepts associated with influence lines. Analysis of simply supported beams under rolling load.

COs	Programme Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1.0	2.0		2.0		1.0				1.0			2.0		
CO2		2.0		2.0		3.0							2.0		
CO3			3.0				3.0						2.0		
CO4			3.0	3.0	3.0			3.0					2.0		
Average	1.0	2.0	3.0	2.3	3.0	2.0	3.0	3.0					2.0		

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Department of Civil Engineering

22UCV403C	**SOIL MECHANICS**	**Credits: 3**
L:T:P - 3:0:0		**CIE Marks:50**
Total Hours/Week: 3		**SEE Marks:50**

UNIT-I	**10Hrs.**
Introduction: Formation of soil, phase diagram, basic definitions and their interrelationships. **Index Properties**-Definitions and their determination, particle size analysis (sieve and Hydrometer analysis) consistency limits and indices, plasticity chart, activity of clay, field identification tests, BIS soil classification (IS: 1498-1970). **Clay Mineralogy**: Soil structure-single grained, honey combed, flocculent and dispersed structures, soil-water system, electrical diffuse double layer, adsorbed water, base-exchange capacity, Isomorphous substitution. Common clay minerals in soil and their structures- Kaolinite, Illite and Montmorillonite and their application in engineering.	
UNIT–II	**10 Hrs.**
Flow Through Soils: Darcy's law-assumption and validity, coefficient of permeability and its determination (laboratory and field), factors affecting permeability, permeability of stratified soils, seepage velocity, superficial velocity and coefficient of percolation, capillary phenomena. **Seepage Analysis:** Laplace equation, assumptions, limitations and its derivation. flow nets-characteristics and applications. Flow nets for sheet piles and below the dam section. Unconfined flow, phreaticline (Casagrande's method–with and without toe filter), flow through dams, design of dam filters.	
UNIT–III	**11 Hrs.**
Compaction of Soil: Definition, pprinciple of compaction, standard and modified proctor's compaction tests, factors affecting compaction, effect of compaction on soil properties, field compaction control- compactive effort & method of compaction, lift thickness and number of passes, Proctor's needle, compacting equipments and their suitability. **Consolidation of Soil**: Definition, Mass-spring analogy, Terzaghi's one dimensional consolidation theory-assumption and limitations (no derivation), normally consolidated, under consolidated and over consolidated soils, pre-consolidation pressure and its determination by Casagrande's method. Consolidation characteristics of soil (C_c, a_v, m_v and C_v), Time rate of consolidation.	
UNIT–IV	**9 Hrs.**
Shear Strength of Soils: Concept of shear strength, Mohr's strength theory, Mohr-coulomb theory, conventional and modified failure envelops, total and effective shear strength parameters, concept of pore pressure, factors affecting shear strength of soils, sensitivity and thixotropy of clay. Measurement of shear parameters- direct shear test, unconfined compression test, triaxial compression test and vane shear test, Test under different drainage conditions.	

Reference Books *

1. G. Ranjan and A.S.R Rao, Basic and Applied Soil Mechanics- New Age International (P) Ltd., New Delhi, 4th Edition 2022.
2. B. C. Punmia, A. K. Jain and A. K. Jain, Soil Mechanics and Foundation Engg.- Laxmi Publications Co, New Delhi. 17th edition 2017.
3. J. Knappett and R. F. Craig, Craig's Soil Mechanics- CRC Press Ninth Edition 2019.
4. B. M. Das, Principles of Geotechnical Engineering with WebAssign - India, Cengage Learning, 10th Edition 2022.

5. V.N.S. Murthy, Text Book of Soil Mechanics and Foundation Engineering- CBS Publishers & Distributors New Delhi 2018.
6. C. Venkatrahmaiah, Geotechnical Engineering, New Age International (P) Ltd., New Delhi 5th Edition 2017.
7. D. P. Coduto, M. R. Yeung and W. A. Kitch, Geotechnical Engineering: Principles & Practices, Pearson, 2nd edition, 2011
8. H. Khan, Text Book of Geotechnical Engineering- PHI, India Second Edition 2005.
9. J. Bowles, Foundation Analysis and Design- McGraw Hill Pub. Co. New York Fifth Edition 2001.
10. A. Singh and G.R. Chowdhary, Soil Engineering in Theory and Practice, CBS Publishers and Distributors Ltd., NewDelhi 1992.

Course Outcomes**

1. Analyse and interpret soil properties and clay mineralogy to effectively apply engineering principles in practical scenarios.
2. Apply Darcy's law, seepage phenomena, and utilize flow nets to solve practical engineering problems related to flow through soils and seepage analysis.
3. Apply the principles of compaction and consolidation to effectively control soil behaviour in engineering projects.
4. Determine settlement of soils and utilize testing methods to find shear strength parameters.

COs	**Programme Outcomes (POs)**												**PSOs**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO1	3	1						1				2		3.0	
CO2	2	1										2		3.0	
CO3	3	2		1				1				2		3.0	
CO4	2	2		1				1				2		3.0	
Average	2.5	1.5		1.0				1.0						3.0	

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22UCV404C	**TRANSPORTATION ENGINEERING**	**Credits: 4**
L:T:P - 4 : 0: 0		CIEMarks:50
Total Hours/Week: 4		SEEMarks:50

UNIT-I	**13 Hrs.**
Highway Development Plans: Historical Development; Functional classification of rural and urban roads; Planning Visions – 2021 (Rural Highways), 2025 (Rural roads), National Urban Transport Policy (NUTP), PMGSY; Components of Detailed Project Report (DPR) of roads; Public Private Partnership Models.	
UNIT–II	**13 Hrs.**
Geometric Design: Design factors; Cross-section elements, Sight distances; Road Alignment - Horizontal and Vertical profiles; Combination of profiles; Placement of utilities and services; Design considerations in hill areas; Design software	
UNIT–III	**13 Hrs.**
Highway Materials and Mix Design: Soil – Desirable properties, Tests – Atterburg limits, Proctor values, CBR, Modulus (k); Stone Aggregates – Desired properties, Tests; Asphalt – Classification, properties, routine tests and modifiers;– Desirable properties for pavements; Bituminous Mix design **Pavement Design:** Factors affecting design; Traffic volume and Axle load survey; Flexible pavements – Layers, design requirements and IRC-37 based design; Rigid pavements: Layers, design requirements, stresses in layers, Design based on IRC-58.	
UNIT–IV	**13 Hrs.**
Highway Construction: Design specification and construction steps of subgrade, embankments, granular layers (GSB, WBM, WMM), bituminous sub-bases, bases, binder and surface courses, concrete pavement (DLC and PQC), Joints in bituminous and rigid pavements; Guidelines for Externally funded Road Projects. **Highway Maintenance:** Types of surface and sub-surface failures, Evaluation and remedial measures; Drainage – surface and sub-surface, Filter design criteria; Design of overlays based on Benkelman Beam and Falling Weight Deflectometer (FWD)	
Reference Books *	

1. Right, Paul H. and Dixon, Karen K., "Highway Engineering", John Wiley and Sons Inc. 2004
2. Khanna, S.K. and Justo, C.E.G., "Highway Material Testing Manual", Nem Chand & Bros. 2004
3. Khanna, S.K. and Justo, C.E.G., "Highway Engineering", Nem Chand & Bros. 2004
4. Papacostas, C.S. and Prevedouros, P.D., "Transportation Engineering and Planning", Prentice Hall. 2002
5. Jotin Khisty, C. and Kent Lall, B., "Transportation Engineering – An Introduction", Third edition, Pearson India 2016
6. Relevant Indian Roads Congress Codes – Geometric Aspects: IRC:38, 69, 73, 86, SP-23. Pavements: IRC:37, 58, 15, 44 Others: IRC:SP-42, SP-88, MORT&H Specifications

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Course Outcomes**

After completion of the course student will be able to

1. Acquire the capability of proposing a new alignment or re-alignment of existing roads, conduct necessary field investigation for generation of required data.
2. Evaluate the engineering properties of the materials and suggest the suitability of the same for pavement construction.
3. Design road geometrics, structural components of pavement and drainage.
4. Apply basic knowledge of various highway construction and maintenance.

COs	Programme Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1.0					2.0								3.0	
CO2	2.0	2.0	2.0											3.0	
CO3	1.0	2.0	2.0	2.0										3.0	
CO4	1.0					2.0								3.0	
Average	1.3	2.0	2.0	2.0		2.0								3.0	

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22UCV405C	**SURVEYING**	**Credits: 4**
L:T:P - 3 : 0: 2		CIEMarks:50
Total Hours/Week: 5		SEEMarks:50

UNIT-I	**10 Hrs.**

Introduction: Definition of surveying, Objectives and importance of surveying. Classification of surveying, Principles of surveying, Units of measurements, Chain and tape types, Surveying measurements and errors.

Measurement of Directions and Angles: Compass survey: Basic definitions, meridians, bearings, magnetic and True bearings. Prismatic and surveyor's compasses, temporary adjustments, declination. Quadrantal bearing system, whole circle bearing system, local attraction.

UNIT–II	**10 Hrs.**

Levelling: Basic terms and definitions, Methods of levelling-Spirit levelling , Types of levels-Dumpy level, auto level, digital and laser levels-Instrument setup, Booking and reduction of levels-HI method, Rise and fall method. Differential levelling, profile levelling, fly levelling, check levelling, reciprocal levelling, Numerical problems.

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

UNIT–III	**10 Hrs.**

Theodolite Survey: Theodolite and types, Fundamental axes and parts of Vernier Transit theodolite, uses of theodolite, Temporary adjustments, measurement of horizontal angles (Repetition and reiteration methods) and vertical angles

Trigonometric Levelling: Determination of Heights and Distances: of an accessible object, Inaccessible object by single plane and double plane methods, Numerical problems.

UNIT–IV	**10 Hrs.**

Tachometry: Basic principle, types of tachometry, Instruments and accessories used in tachometry, distance equation for horizontal and inclined line of sight in fixed stadia hair method, numerical problems.

Curves: Simple curves: Types, Elements, Designation of curves, Setting out of simple curves by linear methods (numerical problems on offsets from long chord & chord produced method), and Setting out curves by Rankine's deflection angle method, Numerical problems.

SURVEYING LABORATORY (INTEGRATED)

1. Demonstration of basic surveying instruments like (Chain, Tape ect…)
2. Setting out hexagon by compass
3. 3. Levelling
   Differential Levelling
   Fly levelling and Fly back leveling
   Reciprocal leveling, Profile and cross section levelling Contouring
4. Theodolite
   Measurement of Horizontal and vertical angles
   Determination of elevation of an object: Base accessible
   Determination of distance and elevation of an object: Base In-accessible- Single Plane.
5. Total Station
   Introduction → Taking Out Basic Measurements (SHV, REM, MLM)
6. Total Station –Station Orientation, Back sighting, Instrument Synchronization, Data Recording.
7. Works on Total Station
   Area Measurement
   Topographic survey
   Set out Parallel Lines
   Downloading an contour map compilation only

Reference Books *

1. B.C. Punmia, Surveying, Vol. 1 , 16th Edition, Laxmi Publications, New Delhi.2005
2. S. S. Bhavikatti, 'Surveying & Leveling Vol-I', I. K. International New Delhi, 2008
3. S.K. Duggal, "Surveying Vol. I & II", Tata McGraw Hill Publishing Co. Ltd. New Delhi.
4. R Subramanian, Surveying and Leveling, Second edition, Oxford University Press, New Delhi.
5. David Clerk, Plane and Geodetic Surveying Vol1 and Vol2, CBS publishers
6. B Bhatia, Remote Sensing and GIS, Oxford University Press, New Delhi.
7. T.M Lillesand, R.W Kiefer,. and J.W Chipman, Remote sensing and Image interpretation, 5th edition, John Wiley and Sons India
8. James M Anderson and Adward M Mikhail, Surveying theory and practice, 7th Edition, Tata McGraw Hill Publication
9. Kang-tsung Chang, Introduction to geographic information systems, McGraw Hill HigherEducation.

Course Outcomes**

After completion of the course student will be able to

1. Students will get the knowledge of basics of surveying and basic instruments used in civil engineering surveys and Application of compass surveying for measurement of areas, bearing and distance along with the direction.
2. Finding the elevation, elevation differences and heights of different objects under different conditions.
3. In finding the elevations of different targets with respect to instruments under different conditions and relative position of different targets with respect to given point.
4. Setting of curves by different methods for different alignments.

COs	Programme Outcomes (POs)												PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO1	3	3	2	1	2	-	-	-	-	-	-	1	2	2	1
CO2	3	3	2	1	2	-	-	-	-	-	-	1	2	2	1
CO3	3	3	2	1	2	-	-	-	-	-	-	1	2	2	1
CO4	3	3	1	1	2	-	-	-	-	-	-	1	2	2	1
Average	3.0	3.0	1.8	1.0	2.0							1.0	2.0	2.0	1.0

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Department of Civil Engineering

22UCV406L	**FLUID MECHANICS LAB**	Credits: 1
L:T:P - 0 : 0 : 2		CIE Marks: 50
Total Hours/Week: 2		SEE Marks: 50

List of experiments

1. Calibration of Orifice.
2. Calibration of mouthpiece.
3. Calibration of triangular notches.
4. Calibration of rectangular notches.
5. Calibration of trapezoidal notches.
6. Calibration of ogee and broad creasted weirs.
7. Calibration of Venturimeter and Orificemeter.
8. Experiments on major and minor losses in the pipes.
9. Impact of jet on the flat and hemispherical vanes

Reference Books *

1. R. K. Bansal, Fluid mechanics, Laxmi Publications; Tenth edition,2018.
2. P. N. Modi and S. M. Seth, Fluid mechanics and Hydraulic Machines by Standard book house; 22nd edition,2017.
3. Bireshwar Majumdar, Fluid mechanics lab manual by PHILearning, 2nd edition 2015.
4. K. L. Kumar. "Engineering Fluid Mechanics Experiments" Eurasia Publishing House.

Course Outcomes** (Students will be able to

4. Calibrate discharge measuring apparatus when fluid is flowing through it.
5. Determine the major and minor in the pipes
6. Determine the impact of water jet flat and hemispherical vanes.

COs	Programme Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1	1							2	2		2			2
CO2	1	1							2	2		2			2
CO3	1	1							2	2		2			2
Average	1	1							2	2		2			2

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22UCV407L	**GEOTECHNICAL ENGINEERING LABORATORY**	Credits: 1
L:T:P - 0 : 0 : 2		CIE Marks: 50
Total Hours/Week: 2		SEE Marks: 50

List of experiments

1. Field identification of fine-grained soils.
2. Field density using
   Core cutter method
   Sand replacement method
3. Natural moisture content using oven drying method.
4. Specific gravity of soil using Pycnometer and density bottle
5. Grain size distribution of
   Coarse grained soil (Sieve analysis)
   Fine grained soil (Hydrometer Analysis)
6. Consistency index of soil
   Liquid limit
   Plastic limit
   Shrinkage limit
7. Permeability of fine-grained and coarse-grained soil
8. Optimum moisture content and maximum dry density using Standard Proctor test / Modified Proctor test
9. Relative density of soil.
10. Free swell index
11. Shear strength of fine and coarse grained soil
    Triaxial test (UU)
    Direct shear box
    Unconfined compression test.
12. California Bearing Ratio (CBR)
13. Coefficient of consolidation and compression index, Augers and samplers, field CBR, SPT, Rapid moisture meter (Demonstration).

Reference Books *

1. SP 36-1 (1987): Compendium of Indian Standards on Soil Engineering: Part-1 Laboratory Testing of Soils for civil Engineering Purposes.
2. SP 36-2 (1988): Compendium of Indian Standards on Soil Engineering: Part-2 Field Testing of Soils For Civil Engineering Purposes.
3. B.C.Punmia, Ashok.K. Jain and Arun. K. Jain, Soil Mechanics and Foundation Engg.- Laxmi Publications Co. , New Delhi. 17th edition 2017.
4. Gopal Ranjan and A.S.R. Rao, Basic and Applied Soil Mechanics- New Age International (P) Ltd., New Delhi Fourth Edition 2022.
5. Geotechnical Laboratory Manual, BEC.

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Course Outcomes (Students will be able to**

1. Identify different types of soils in laboratory and field.
2. Evaluate index and engineering properties of soil.
3. Operate the different soil testing equipment inside the laboratory and conduct test in the field.

COs	Programme Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1	1							2	2		2		2	
CO2	1	1							2	2		2		2	
CO3	1	1							2	2		2		2	
Average	1	1							2	2		2		2	

Basaveshwar Engineering College, Bagalkote

B.E–3rd Year Scheme of Teaching and Examinations

(2022-23 Admitted Batch)

Semester V: Branch: Civil Engineering

Sl. No.	Course			Teaching Department	Teaching hours and Scheme of Evaluation						
	Category	Code	Title		Lecture	Tutorial	Practical/ Drawing	CIE Marks	SEE Marks	Total Marks	Credits
					L	T	P				
1.	PCC	22UCV501C	Water Treatment and Supply Engineering	Civil Engineering	3	0	0	50	50	100	3
2.	PCC	22UCV502C	Analysis of Statically Indeterminate Structures	Civil Engineering	3	0	0	50	50	100	3
3.	PCC	22UCV503C	Foundation Engineering	Civil Engineering	3	0	0	50	50	100	3
4.	PEC	22UCV5XXE	Professional Elective Course-I	Civil Engineering	3	0	0	50	50	100	3
5.	OEC	22UCV5XXN	Open Elective Course-I	Respective Department	3	0	0	50	50	100	3
6.	PCC	22UCV506L	Environmental Engineering Lab	Civil Engineering	0	0	2	50	50	100	1
7.	PCC	22UCV507L	Transportation Engineering Lab	Civil Engineering	0	0	2	50	50	100	1
8.	HSMC	22UBT523C	Environmental Studies	Biotechnology	1	0	0	50	50	100	1
9	AEC	22UHS521C	Quantitative Aptitude and Professional Skills	Humanities	2	0	0	50	50	100	2
10	MC	22UHS001M/ 22UHS002M 22UHS003M 22UHS004M	NSS/Yoga/PE/Music	Humanities	-	-	-				0
					18	**0**	**4**	**450**	**450**	**900**	**20**

Professional Elective Course-I					Open Elective- 1				
Code	Title	L	T	P	Code	Title	L	T	P
22UCV511E	Alternative Building Materials and Technologies	3	0	0	22UCVXXXN	Ground water Hydrology	3	0	0
22UCV512E	Traffic Engineering	3	0	0	22UCVXXXN	Remote Sensing and GIS	3	0	0
22UCV513E	Air pollution and control	3	0	0	22UCVXXXN	Process Economics and Plant Design	3	0	0
22UCV514E	Ground Improvement Techniques	3	0	0	22UCVXXXN	Sustainable Development	3	0	0
22UCV515E	Advanced Surveying	3	0	0	22UCV531N	Air Pollution and Control	3	0	0
22UCV516E	Masonry Structures	3	0	0	22UCV536N	Green Building Technology	3	0	0

22UCV501C	WATER TREATMENT AND SUPPLY ENGINEERING	Credits: 03
L:T:P - 3 : 0: 0		CIEMarks:50
Total Hours/Week: 3		SEEMarks:50

UNIT-I	10 Hrs

Quality of water: Wholesome, potable and palatable water, waterborne diseases. **Examination of Water** -Objectives –Physical, Chemical and Microbiological Examinations. Drinking water quality standards - BIS & WHO guidelines. Health significance of Fluoride, Nitrates and heavy metals like Mercury, Cadmium, Arsenic etc. Sampling of water and types of water sampling.

Water demand and quantity: Types of water demand - domestic, institutional, commercial, public, and water losses. Estimation of Fire demand and Per-capita demand- factors affecting. Numerical problems.

Self Study Component: Sources of water and different intake structures.

UNIT–II	10 Hrs.

Population forecasting: Different methods with merits & demerits, variations in demand of water, peak factors, design periods. Design period, factors affecting for design period. Numerical problems.

Sedimentation: Introduction, objectives, types of settling, factors affecting settling. Theory of settling, settling velocity, Stroke's equation, types of settling tanks, design of circular, rectangular tanks.

Modern water supply scheme: Necessity, planning and execution of modern water supply scheme.

Self Study Component: Treatment flow-charts for surface and ground water.

UNIT–III	10Hrs.

Coagulation and Flocculation: Coagulant aided sedimentation: Objectives, common coagulants, factors affecting, jar test, chemical feeding, flash mixing, flocculation and clari-flocculation.

Filtration: Slow-sand, rapid-sand and pressure filters including construction, operation, cleaning and design (excluding under drainage system), numerical problems. operational troubles in filters.

Disinfection: Types of disinfectants, chlorination, chlorine demand, residual chlorine, use of bleaching powder, numerical problems. Minor methods of disinfection.

Self Study Component: Different methods of coagulant feeding, inlet and outlet arrangement for sedimentation tanks

UNIT–IV	10 Hrs.

Miscellaneous Treatment Methods: Softening - Lime soda process and Zeolite process, numerical problems. Reverse Osmosis & Membrane Filtration. Removal of Iron and Manganese. Colour, odour and taste removal. Fluoridation, Defluoridation and Desalination.

Distribution Systems: System of supply, service reservoirs and their capacity determination, numerical problems, pipe appearances, pipefitting, layout of water supply pipes in buildings.

Self Study Component : Nalgonda and Prasanti Techniques for defluoridation

Reference Books *

1. **Environmental Engineering-**Howard S. Peavy, Donald R. Rowe, George Tecno Bano Glous, McGraw Hill International Edition, 2017.
2. **Environmental Engineering-I** – B.C. Punmia & Ashok Jain, Lakshmi Publications (P) Ltd.
3. **Water supply Engineering** – S.K.Garg, Khanna Publishers, New Delhi.2015
4. **Manual on Water supply and treatment** – CPHEEO, Ministry of Urban Development, New Delhi.2007
5. **Water Supply and Sanitary Installations,** Panchadhari. A.C.New Age International Publishers, New Delhi.
6. **Handbook on Water Supply and Drainage,** SP 35 (1987): (with Special Emphasis on Plumbing) [CED 24: Public Health Engineering.]

Course Outcomes

After completion of the course student will be able to

1. Apply knowledge of basic science for testing and analyze the drinking water qualityparameters from public health consideration as per standards.
2. Analysis of forecasting population to determine total quantity of water to meet demands of thecommunity.
3. Design various water treatment units to remove selected impurities in raw water
4. Select miscellaneous treatment methods and analyze the community pipe network of waterdistribution.

Course Articulation Matrix (CAM)

Sl. No.	Course Outcomes (CO's)	Program outcomes (PO's)											
		1	2	3	4	5	6	7	8	9	10	11	12
01	CO1	3	3		2			3	2				2
02	CO2	3	2					2					2
03	CO3	2	2	3				3					2
04	CO4	2	3					3					2

Course Code: 22UCV502C	ANALYSIS OF INDETERMINATE STRUCTURES	Credits : 03
Hours/Week (L: T:P): 3-0-0		CIE Marks : 50
Total Hours of Pedagogy (Theory): 40		SEE Marks : 50
Course Type: Theory		

Course Objectives:

- Determination of the moments in indeterminate beams and frames using slope deflection methods
- Determination of the moments in indeterminate beams and frames using moment distribution methods
- Determination of the moments in indeterminate beams and frames using Kani's methods
- Analyzing and construct the bending moment diagram for beams using stiffness method and flexibility method.

UNIT - I	10 Hrs.

Slope Deflection Method: Introduction, sign convention, development of slope deflection equation, analysis of continuous beams including settlements, Analysis of orthogonal rigid plane frames including sway frames with kinematic indeterminacy ≤ 3

UNIT - II	10 Hrs.

Moment Distribution Method: Introduction, Definition of terms, Development of method, Analysis of continuous beams with support yielding, Analysis of orthogonal rigid plane frames including sway frames with kinematic indeterminacy ≤ 3

UNIT - III	8 Hrs.

Kani's Method: Introduction, Concept, Relationships between bending moment and deformations, Analysis of continuous beams with and without settlements, Analysis of frames with and without sway

UNIT - IV	12 Hrs.

Matrix Method of Analysis (Flexibility Method): Introduction, Axes and coordinates, Flexibility matrix, Analysis of continuous beams using system approach, with static indeterminacy ≤ 3 Matrix Method of Analysis (Stiffness Method): Introduction, Stiffness matrix, Analysis of continuous using system approach, with kinematic indeterminacy ≤ 3

Suggested Learning resources

Text Books

1. B C Punmia, A K Jain and A K Jain- Theory of structures, 12th edition, Laxmi Publications, New Delhi, 2004.
2. Pandit G S, Gupta S P and Gupta R- Theory of Structures, 2nd edition, Tata mcgrawHill Publishing Company Ltd, New Delhi, 2008.
3. Negi L S and Jangid R S- Structural Analysis, Tata mcgraw-Hill Publishing Company Ltd, New Delhi, 2004
4. K.U. Muthu, H.Narendra etal, "Indeterminate Structural Analysis", IK International Publishing Pvt. Ltd.

Course Outcomes:

1. Determine the moment in indeterminate beams and frames having variable moment of inertia and subsidence using slope defection method
2. Determine the moment in indeterminate beams and frames of no sway and sway using moment distribution method.
3. Construct the bending moment diagram for beams and frames by Kani's method.
4. Construct the bending moment diagram for beams using flexibility method and stiffness method

CO and PO Mapping

Course Outcomes	Programme Outcomes											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	1	2	-	2	-	1	-	-	-	1	-	-
CO2		2	-	2	-	3	-	-	-	-	-	-
CO3			3	-	-	-	3	-	-	-	-	-
CO4			3	3	3	-	-	3	-	-	-	-

22UCV503C	Foundation Engineering	Credits: 3
L:T:P - 3:0:0		CIE Marks:50
Total Hours/Week: 3		SEE Marks:50

UNIT-I	10Hrs.

Subsurface exploration- Importance of exploration program, methods of exploration: boring, sounding tests, geophysical methods-electrical resistivity and seismic refraction methods. Types of samples-undisturbed, disturbed and representative samples samplers, sample disturbance, area ratio, recovery ratio, clearance stabilisation of boreholes - typical bore log. Number and depth of borings for various civil engineering structures, soil exploration report.

UNIT–II	10 Hrs.

Stress in Soils- Introduction, Boussinesq's and Westergaard's theory of concentrated load, circular and rectangular load, equivalent point load method, pressure distribution diagrams and contact pressure, Newmark's chart.

Effective Stress Analysis- Geostatic stresses, effective stress concept-total stress, effective stress and neutral stress and impact of the effective stress in construction of structures, quick sand phenomena.

UNIT–III	11 Hrs.

Lateral earth pressure- Active and passive earth pressures, earth pressure at rest, earth pressure coefficient. Earth pressure theories - Rankine's and Coulomb's – assumptions and limitations, graphical solutions for active earth pressure (cohesionless soil only) – Culmann's and Rebhann's methods lateral earth pressure in cohesive and cohesionless soils, earth pressure distribution.

Stability of earth slopes - Types of slopes, causes and type of failure of slopes. Definition of factor of safety, stability of finite and infinite slopes - method of slices, friction circle method, Fellineous method, Taylor's stability number

UNIT–IV	9 Hrs.

Bearing Capacity of Shallow Foundation- Types of foundations, Determination of bearing capacity by Terzaghi's and BIS method (IS: 6403), Modes of shear failure, Factors affecting Bearing capacity of soil. Effect of water table and eccentricity on bearing capacity of soil, field methods of determining bearing capacity of soil - SPT and plate load test.
Foundation settlement-Types of settlements and importance, Computation of immediate and consolidation settlement, permissible differential and total settlements (IS 8009 part 1).

Reference Books *

1. A. Singh and Chowdhary G.R. (2017), "Soil Engineering in Theory and Practice". CBS Publishers and Distributors Ltd., NewDelhi.
2. B. M. Das and N. Sivakugan, Principles of Foundation Engineering with MindTap, Cengage Learning, 9th Edition, 2019.
3. B.C. Punmia (2021), 17th Edition "Soil Mechanics and Foundation Engg". Laxmi Publications Co. , New Delhi.
4. J.E. Bowles (2017), 5th Edition, "Foundation Analysis and Design". McGraw Hill Pub. Co.

New York.
5. V.N.S. Murthy (2018), 4th Edition, "Soil Mechanics and Foundation Engineering".UBS Publishers and Distributors, New Delhi.
6. G. Ranjan and A.S.R Rao. (2022), "Basic and Applied Soil Mechanics". New Age International (P) Ltd., New Delhi.
7. C.Venkatrahmaiah (2018), 6th Edition "Geotechnical Engineering". New Age International (P) Ltd., Newe Delhi.
8. B. M. Das (2002), 5th Edition, Principles of Geotechnical Engineering- Thomson Business Information India (P) Ltd., India.
9. I. H. Khan (2005), 2nd Edition, Text Book of Geotechnical Engineering- PHI, India.

Course Outcomes**

After completion of the course student will be able to:

1) Evaluate and interpret various soil test results to determine soil properties and geotechnical parameters for engineering design.
2) Demonstrate proficiency in determining vertical stress in the soil, effective stresses by considering pore water pressure and their role in soil behavior and stability analysis.
3) Apply knowledge of lateral earth pressure and slope stability to real-world engineering projects, considering slope geometry and soil types.
4) Calculate and interpret ultimate and allowable bearing capacities and settlement of soil using different methods

COURSE ARTICULATION MATRIX:

Course Outcomes	Programme Outcomes												Programme Specific Outcomes		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO 1	3	-	-	-	-	-	-	-		-	-	2	2	1	-
CO 2	3	1	-	-	-	-	-	-	-	-	-	2	2	1	1
CO 3	3	2	2	2	-	-	-	-	-	-	-	2	2	1	1
CO 4	3	2	2	2	-	-	-	-	-	-	-	2	2	1	1

22UCV506L	ENVIRONMENTAL ENGINEERING LAB	**Credits: 1**
L:T:P - 0: 0: 2		CIE Marks: 50
Total Hours/Week: 2		SEE Marks: 50

I. Tests on Water Quality

i. Physical Parameters

1) To find the colour of a given sample of water.
2) To find the turbidity of a given sample of water.
3) To determine the conductivity of a given sample of water.
4) To determine the temperature of a given sample of water.

ii. Chemical Parameters

1) To find out total dissolved solid, settle able solids, suspended solids and volatile solids of the given sample.
2) To determine the pH value of a given sample of water.
3) To determine the acidity of a given sample of water.
4) To determine the carbonate, bicarbonate, and hydroxide alkalinity of a sample.
5) To find out the concentration of chlorides in the given sample of water.
6) To estimate the hardness of the given sample of water by standard EDTA method.
7) To determine the sulphate of a given sample of water.
8) To determine the fluoride of a given sample of water.
9) To determine the Iron of a given sample of water.
10) To determine residual chlorine in a given sample of water.
11) To determine chlorine demand for the given sample of water.
12) To determine nitrate in a given sample of water.
13) To determine dissolved oxygen in a given sample of water.

iii. Bacteriological Parameters

1) To determine MPN of coliforms of the given sample.
2) Microbial Examination of Water Samples Using the Membrane Filtration Technique.

II. Tests on Sewage

1) To determine biochemical oxygen demand (BOD) exerted by the given wastewater sample.

2) To determine Chemical oxygen demand (COD) exerted by the given wastewater sample.

UIII. Other Tests

1) To determine the optimum dose of alum required to treat the given water.
2) To determine the percentage of chlorine present in the given bleaching powder.

References

1. Manual of Water and Wastewater Analysis- NEERI Publication 1988.
2. Standard methods for Examination of Water and Wastewater Analysis APHA, AWWA. 2011.
3. Manual for Sewer and Sewerage, Central Public Health & Environmental Engineering

Organization, Ministry of Housing and Urban Development, Govt. of India.

4. Manual for water supply and treatment, Central Public Health & Environmental Engineering Organization, Ministry of Housing and Urban Development, Govt. of India.

Course Outcomes**

After completion of the course student will be able to

1. Able to determine the physical, chemical and biological parameters for drinking purpose as per BIS standards.
2. Analyze the test results and recommend the water for its potability.
3. Identify and characterize wastewater using standard methods.
4. Analyze the test results and recommend wastewater for its disposal.

*** Books to be listed as per the format with decreasing level of coverage of syllabus**

**** Each CO to be written with proper action word and should be assessable and quantifiable**

Course Outcomes	Programme Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	2	2	2	2	2	-	2	1	-	2	3	2	3
CO2	3	3	2	2	1	1	2	-	1	1	-	2	3	2	2
CO3	3	3	2	2	2	1	2	-	2	1	-	2	3	2	3
CO4	3	2	-	-	-	-	-	-	-	-	-	-	2	2	-

22UCV507L	Transportation Engineering Lab	Credits: 1
L:T:P - 0 : 2: 0		CIEMarks:50
Total Hours/Week: 2		SEEMarks:50

Sand: Bulking of sand , Zoning , Specific gravity and water absorption

AGGREGATES: Crushing, abrasion, impact and Shape tests (Flaky, Elongation, Angularity number) Specific gravity and water absorption

BITUMINOUS MATERIALS AND MIXES: Specific Gravity, Penetration, Ductility, Softening point, Flash and fire point, Viscosity Marshall Stability tests

SUBGRADE SOIL: CBRTest

Reference Books *

1. Khanna, S.K. and Justo, C.E.G., "Highway material testing Lab manual", Nem Chand & Bros. 2004
2. K. Subramaniam, "Transportation Engineering", SciTech Publications, Chennai.
3. Relevant Indian Roads Congress Codes –
4. Right, Paul H. and Dixon, Karen K., "Highway Engineering", John Wiley and Sons Inc. 2004

LABORATORY ASSESSMENT:

1. Each Laboratory subject is evaluated for 100 marks (50 CIE and 50 SEE).
2. Allocation of 50 marks for CIE
   * Performance and journal write up:
     Marks for each experiment = 30 marks/ No. of proposed experiments.
   1. One Practical test for 20 Marks. (5 write-up, 10 conduction, calculation, results etc., 5 viva-voce)
3. Allocation of 50 marks for SEE.

***** 25% write-up, 50% conduction, calculation, results etc., 25% viva-voce.

Course Outcomes

1. Evaluate bulking, zoning, specific gravity, and water absorption characteristics of sand for construction applications.
2. Perform crushing, abrasion, impact, and shape tests to determine the suitability of aggregates in construction.
3. Conduct tests on bituminous materials, including specific gravity, penetration, ductility, viscosity, and Marshall Stability, to assess their performance in road construction.
4. Determine the strength of subgrade soil using the California Bearing Ratio (CBR) test for pavement design

CO-PO mapping

Course Outcomes	Programme Outcomes											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	2	2	3							1		1
CO2	2	2	3							1		1
CO3	2	2	3							1		1
CO4	2	2	3							1		1

BVV Sangha's
Basaveshwar Engineering College, Bagalkote
Civil Engineering Department

UCV511E	ALTERNATIVE BUILDING MATERIALS AND TECHNOLOGIES	**Credits: 3**
L: T: P - 4: 0: 0		CIE Marks: 50
Total Hours/Week: 3		SEE Marks: 50

UNIT-I	**10 Hrs.**
Energy in building materials, Environmental issues concerned to building materials, Embodied energy and life-cycle energy, Global warming and construction industry, Green concepts in buildings, Green building ratings–IGBC and LEED manuals–mandatory requirements, Rain water harvesting, Environmental friendly and cost effective building technologies, Requirements for buildings of different climatic regions.	
UNIT–II	**10 Hrs.**
Fibre Reinforced Concrete (FRC)-Fibers-metal and synthetic, Properties and applications. Fibers organic and synthetic, Properties and applications, behavior of FRC member under Flexure, Shear and Tension conditions. Numerical Problems on FRC.	
UNIT–III	**10 Hrs.**
Ferrocement– Materials used in ferrocement, definition, materials properties of ferrocement, casting of ferrocement members, properties of ferrocement members, Building materials from agro and industrial wastes, Types of agro wastes, Types of industrial and mine wastes, Properties and applications.	
UNIT–IV	**10 Hrs.**
Alternative Building Technologies: Alternate Roofing Systems: Concepts, Filler slabs, Composite beam panel roofs **Prefabricated structures**: Introduction, Need, equipment used, method of casting prefabricated building components, Advantages**.**	

Reference Books*

1. K S Jagadish, B V Venkatarama Reddy and K S Nanjunda Rao,"Alternative Building Materials and Technologies", New Age International publications.
2. R J S S pence and D J Cook,"Building Materials in Developing Countries",Wiley pub.
3. IGBC Green Homes Rating System, CII publications
4. Relevant IS Codes.

Course Outcomes**

After studying this course, students will be able to:

1. Solve the problems of Environmental issues concerned to building materials and cost effective building technologies;
2. Select appropriate type of masonry unit and mortar for civil engineering constructions;.

3. Analyse different alternative building materials which will be suitable for specific climate and in an environmentally sustainable manner.

4. Recommend various types of alternative building materials and technologies and design energy efficient building by considering local climatic condition and building material.

Course Outcomes	Programme Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	2	-	2	2	-	-	-	-	-	-			
CO2	2	2	3	-	2	1	-	-	-	-	-	-			
CO3	2	2	3	-	3	-	-	-	1	-	-	-			
CO4	2	1	1	-	2	1	-	-	1	-	-	**1**			

22UCV512E	Traffic Engineering	Credits: 3
L:T:P - 3 : 0: 0		CIE Marks:50
Total Hours/Week: 3		SEE Marks:50

UNIT-I	10 Hrs.
Introduction: Definition-Objective Scope of Traffic Engineering. Road User and Vehicle Characteristics Static and Dynamic characteristics- Power performance of vehicles- Resistances to the motion of vehicles- Reaction time of driver- Problems of above	
UNIT–II	**10 Hrs.**
Traffic Parameter Studies and Analysis: Various types of traffic engineering studies, data collection, Objectives and Method of study. Definition of study area- Sample size- Data Collection and Analysis-Interpretation of following Traffic Studies- Volume, Spot Speed study, presentation of spot speed data problems on spot speed, Speed and Delay study Origin and Destination. Parking-on Street and off Street Parking, Accidents-Causes, Analysis (collision with parked vehicle only) Measures to reduce Accident,	
UNIT–III	**10 Hrs.**
Traffic Flow Theories: Traffic flow theory Green shield theory Goodness of fit correlation and regression analysis (linear only)- Queuing theory Car following theory relevant Problems on above. Traffic Regulation- Driver, Vehicle and Road controls- Traffic Regulations- One Way- Traffic Signs- Traffic Markings-Canalization, Classified traffic volume at intersections, PCU, Traffic Rotary elements, analysis of capacity of rotary	
UNIT–IV	**10 Hrs.**
Traffic Control: Traffic operation Traffic Signals-Vehicle actuated and synchronized signals Signal Coordination – Intelligent Transport system- Webster's method of signal Design, IRC Method, Street lighting Road Side Furniture.	

Reference Books *

1. Khanna and Justo., "Highway Engineering" Nemchand Bros
2. L.R. Kadiyali., " Traffic Engineering and Transport Plankling". Khann Publisher.
3. Matson, Smith and Hurd.," Traffic Engineering ", McGraw Hill and Co
4. Traffic flow theory Drew McGraw Hill Co.,

REFERENCE BOOKS:

1. Pignataro.," Traffic Engineering"., Prentice Hall
2. Highway capacity Manual-2000
3. An Introduction to Transportation Engineering, Jotin Khistey and Kent Lall, PHI.
4. Traffic Engineering-Mc Shane and Roess, PHI

Scheme of Examination: Student has to answer five questions selecting at least one question from each UNIT out of eight.

Course Outcomes**

After completion of the course student will be able to

1. Able to analyze the vehicles behavior and reaction time of driver

2. Able to interpretate the traffic data in analyzing different vehicular speeds. Able to provide different parking facilities and analyze the accidents and give the remedial measures

3. Understand the traffic flow behavior able to design rotary and channelization

4. Design the signals by different methods and understands ITS

***Books to be listed as per the format with decreasing level of coverage of syllabus**

**** Each CO to be written with proper action word and should be assessable and quantifiable**

Course Outcomes	**Programme Outcomes (POs)**												**Program Specific Outcomes (PSOs)**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO1	3	3	2	-	2	2	-	-	-	-	-	-	**3**		
CO2	3	2	3	-	2	1	-	-	-	-	-	-		**2**	
CO3	3	2	3	-	3	-	-	-	1	-	-	-			
CO4	2	1	1	-	2	1	-	-	1	-	-	**1**			**2**

22UCV513E	**AIR POLLITION AND CONTROL**	Credits: 3
L:T:P - 3 : 0 : 0		CIE Marks: 50
Total Hours/Week: 3		SEE Marks: 50

UNIT-I	**10 Hrs.**

Introduction:
Definition, Sources, classification and characterization of air pollutants. Effects of air pollution on health, vegetation & materials. Atmosphere and water bodies, Photo-chemical Smog, .

UNIT–II	**10 Hrs.**

Meteorology:
Temperature lapse rate & stability, wind velocity & turbulence, plume behavior, measurement of meteorological variables, wind rose diagrams, Plume Rise, estimation of effective stack height and mixing depths. Development of air quality models-Gaussian dispersion model and Numerical problems.

UNIT–III	**10Hrs.**

Sampling:
Sampling of particulate and gaseous pollutants (Stack, Ambient & indoor air pollution), Monitoring and analysis of air pollutants ($PM_{2.5,}$ PM_{10}, SO_X, NO_X, CO, NH_3) and Air pollution emission standards and Numerical problems

UNIT–IV	**10 Hrs.**

Control Techniques:
Air pollution control devices, equipment and their design. Particulate matter and gaseous pollutants- settling chambers, cyclone separators, scrubbers, filters & ESP. Including Numerical problems. Indoor air quality-sources, types and control of air pollutants

Reference Books *

1. M. N. Rao and H V N Rao, "Air pollution", Tata Mc-G raw Hill Publication.
2. H. C. Perkins, "Air pollution". Tata McGraw Hill Publication
3. Mackenzie Davis and David Cornwell," Introduction to Environmental Engineering" McGraw-Hill Co. Noel De Nevers, "Air Pollution Control Engineering" , Waveland Pr Inc.
Anjaneyulu Y, "Text book of Air Pollution and Control Technologies", Allied Publishers

Course Outcomes

After studying this course, students will be able to:
1. Identify the major sources of air pollution and understand their effects on health and environment.
2. Evaluate the dispersion of air pollutants in the atmosphere and to develop air quality models.
3. Ascertain and evaluate sampling techniques for atmospheric and stack pollutants.
4. Choose and design control techniques for particulate and gaseous emissions

Course Outcomes	Programme Outcomes												Programme Specific Outcomes		
	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2	PSO3
CO 1	1	2	1								1	1	2		
CO 2	1	1	2								2	1	2		
CO 3	1	2	1								1	1	2		
CO 4	1	1	1								2	1	2		

22UCV514E	GROUND IMPROVEMENT TECHNIQUES	Credits: 3
L:T:P - 3 : 0: 0		CIEMarks:50
Total Hours/Week: 3		SEEMarks:50

UNIT-I	10Hrs

Introduction: Principles and objectives of ground improvement and History of ground improvement developments. Classification of ground improvement techniques, Factors affecting ground improvement.

Soil improvements without additives - dynamic compaction - equipment used - application to granular soils - cohesive soils - depth of improvement - environmental considerations - induced settlements - compaction using vibratory probes - vibro techniques vibro equipment - the vibro compaction and replacement process - control of verification of vibro techniques - vibro systems and liquefaction

UNIT–II	10 Hrs.

Soil improvement- by thermal treatment, preloading techniques, surface compaction and introduction to bio technical stabilization, Gravel, sand, stone columns-construction techniques

Hydraulic modification: Filters, Control of ground water seepage, Sand drains and wick drains, Well point system, Vertical drains, Electro osmosis and its application in ground improvement.

UNIT–III	10 Hrs.

Chemical modification - lime stabilization - lime column method - stabilization of soft clay or silt with lime - bearing capacity of lime treated soils - control methods –lime fly ash columns.

Grouting - commonly used chemicals for grouting, grouting systems, grouting operations, applications. Compaction grouting – introduction, application and limitations. Plant for preparing grouting materials. Jet grouting- jet grouting process, geometry and properties of treated soils and applications.

UNIT–IV	10 Hrs.

Soil improvement using reinforcing elements - introduction to reinforced earth - load transfer mechanism and strength development. Anchored earth nailing reticulated micro piles, soil dowels, soil anchors and reinforced earth walls. Geotextiles - polymer type geotextiles, woven geotextiles, non woven geotextiles. Geo grids - physical and strength properties - behaviour of soils on reinforcing with geotextiles - effect on strength, bearing capacity, compaction and permeability.

Reference Books *

1. Purushothama Raj., Ground Improvement Techniques, Laxmi Publications Pvt Ltd, 2nd edition, 2016
2. Manfired R.H. (1990), Engineering Principles of Ground Modification, McGraw-Hill Pub.
3. Koerner R M., Construction and Geotechnical Methods in Foundation Engineering, McGrawHill Pub Co New York, 1985.
4. Hausmann, M R, Engineering Principles of Ground Modifications, McGraw Hill Pub Co NewYork, 1990.
5. Ingles O G and Metcalf J B., Soil Stabilisation: Principles and practice, Butterworths, London, 1972.
6. Nelson J D and Miller D J., Expansive soils, John Wiley and sons. Inc new, 1992.
7. Hausmann, M.R. (1990). Engineering Principles of Ground modification. McGraw-Hill Inc.,USA
8. Mooseley, M.P. and Kirsch, K. (2004). Ground Improvement. 2nd Edition, Spon Press, Taylor and Francis Group, London, United Kingdom
9. Jie Han. (2015) Principles and practice of Ground Improvement techniques 1st Edition, John Wiley and sons

Course Outcomes**

After completion of the course student will be able to

1. Suggest the soil properties without additives by using techniques like vibro compaction, dynamic tamping, compaction piles etc… and characterize the problematic soils
2. enhance the properties of soil in field using thermal, preloading, surface compaction Gravel, hydraulic techniques, stone columns.
3. explore the concept of soil chemical modification techniques and grouting system
4. recognize the need for Soil reinforcement technique like reinforcement with strip, in-situ ground reinforcement, ground anchors and soil nailing etc… and geosynthetics

COURSE ARTICULATION MATRIX:

Course Outcomes	Programme Outcomes												Programme Specific Outcomes		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO 1	3	3	3	2	3	3	-	-	-	-	-	2	2	2	2
CO 2	3	3	3	3	3	3	-	-	-	-	-	2	2	2	2
CO 3	3	3	3	3	3	3	-	-	-	-	-	2	2	2	2
CO 4	3	3	3	3	3	3	-	-	-	-	-	2	2	2	2

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22UCV515E	**Advanced Surveying**	**Credits: 3**
L:T:P - 4 : 0: 0		CIE Marks:50
Total Hours/Week: 3		SEE Marks:50

UNIT-I	**10 Hrs.**
Total station, GPS, DGPS, Drone survey - Introduction, Types of EDM instruments, Working principle, Applications.	
UNIT–II	**10 Hrs.**
Measurement of area: Cross staff survey, co-ordinates method, planimeter and digital planimeter. Measurement of volumes-trapezoidal and prismoidal formulae. Measurement of volume by mid ordinate method, trapezoidal and prismoidal formulae.	
UNIT–III	**10 Hrs.**
Aerial Photogrammetry: Uses, Aerial photographs, Definitions, Scale of vertical photograph, Ground Co-ordinates, Derivation of Relief Displacements formula, Ground control, Procedure of aerial survey, overlaps and pocket and mirror Stereoscope, Derivation of Parallax equations, and numerical problems. **Digital Photogrammetry**: Introduction, need, instruments used for digital photogrammetry	
UNIT–IV	**10 Hrs.**
Remote Sensing: fundamentals of Remote Sensing. Electromagnetic Spectrum. Process of remote sensing. Types of reflections, Energy Interactions with earth atmosphere and surface features, spectral reflectance curves-For Vegetation, soil & water, Idealized Remote Sensing System **Geographical Information System**: Components, concept, Data acquisition for GIS input-Spatial and Non spatial data, rectification, processing, verification & Data Editing, Storage and Output.	

Reference Books *

1. B.C. Punmia, Surveying, Vol. 1 , 16th Edition, Laxmi Publications, New Delhi.2005
2. S. S. Bhavikatti, 'Surveying & Leveling Vol-I', I. K. International New Delhi, 2008
3. S.K. Duggal, "Surveying Vol. I & II", Tata McGraw Hill Publishing Co. Ltd. New Delhi.
4. R Subramanian, Surveying and Leveling, Second edition, Oxford University Press, New Delhi.
5. David Clerk, Plane and Geodetic Surveying Vol1 and Vol2, CBS publishers
6. B Bhatia, Remote Sensing and GIS, Oxford University Press, New Delhi.
7. T.M Lillesand, R.W Kiefer,. and J.W Chipman, Remote sensing and Image interpretation, 5th edition, John Wiley and Sons India
8. James M Anderson and Adward M Mikhail, Surveying theory and practice, 7th Edition, Tata McGraw Hill Publication.

Course Outcomes**

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After completion of the course student will be able to

1.Obtain distances and elevations in total station, conduct topographic surveys and generate profile drawings, apply the concept of drone in civil engineering surveys,

2. Determine areas and volumes of different terrains using different mathematical approaches

3 Generate Large Scale topographic maps for roads, irrigatio n works etc…

4.Interpret the satellite images for identifying various features on the ground, prepare base maps in soft copy and hard copy format, use the same for Land Use planning .

Course Outcomes	**Programme Outcomes (POs)**												**Program Specific Outcomes (PSOs)**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO1	3	3	2	-	2	2	-	-	-	-	-	-			
CO2	3	2	3	-	2	1	-	-	-	-	-	-			
CO3	3	2	3	-	3	-	-	-	1	-	-	-			
CO4	2	1	1	-	2	1	-	-	1	-	-	**1**			

22UCV516E: MASONRY STRUCTURES
Credits 03 (3-0-0)

UNIT-I

MASONRY UNITS, MORTARS, TYPES AND MASONRY CONSTRUCTION: Brick, stone, concrete block, stabilized mud block masonry units-strength, modulus of elasticity,and initial rate of absorption (IRA) of brick, classification and properties of mortar, workability of fresh mortar, water retentivity of mortar, stress-strain behavior of mortar, selection of mortars. Defects and errors in masonry construction, cracks in masonry, types, reasons for cracking and remedial measures.

05 Hrs

STRUCTURAL MASONARY: Introduction, stresses in masonry in compression, factors influence compressive strength of masonry; effect of unit strength, unit height, hollowness and moisture absorption, effect of mortar strength, plasticity, joint thickness, type of masonry loading, modular ratio of unit and mortar and direction of loading. Strength formulae and mechanism of failure for masonry prism subjected to direct compression.

05 Hrs

UNIT-II

DESIGN CONSIDERATIONS: Boundary conditions and the effective height of wall in the design of masonry wall and column; effective length of wall based on conditions of support and, effective thickness for solid wall, cavity wall with and without stiffeners; slenderness ratio; assessment of eccentricity of loading on walls.

05 Hrs

PERMISSIBLE STRESSES: Permissible compressive stress in masonry wall, stress reduction, area reduction and shape reduction factors, increase in permissible stresses for eccentric vertical and lateral loads, permissible tensile and shear stresses in masonry wall.

0**4 Hrs**

UNIT-III

DESIGN OF MASONRY WALLS: Reduction of basic compressive strength to allow slenderness ratio and eccentricity; elastic buckling of brittle columns. Design of load bearing masonry for building up to three storeys using IS: 1905-1987.

05 Hrs

DESIGN OF SOLID WALLS: Design of axially loaded unstiffened solid wall; determination of safe load carrying capacity of wall. Design of solid wall with piers. solid wall supported at the ends by cross wall.

04 Hrs

UNIT-IV

DESIGN OF CAVITY WALL: Design of cavity wall with and without piers. Design of cavity wall with cross wall. Determination of safe load carrying capacity of cavity wall.

05 Hrs

DESIGN OF FREE-STANDING WALL: Transverse load acts perpendicular to plane of wall. Lateral load acts in the plane of wall. Design of free-standing walls with and without staggered, design of masonry tabular structure representing a chimney.

05 Hrs

REFERENCE BOOKS:

1. Brick and Reinforced Brick Structures Dayaratnam P.: Oxford & IBH, 1987
2. Alternative Building Materials and Technologies, K S Jagadish, B V Venkatarama Reddy, K S Nanjunda Rao 2008
3. Design of Masonry structures Sinha B.P Davies S.R: E & FN spon 1997
4. Structural Masonry Henry, A.W.: Macmillan Education Ltd, 1990
5. IS 1905-1987 Code of practice for structural use of un-reinforced masonry (3rd revision) BIS, New Delhi.
6. SP 20 (S&T)-1991, Hand book on Masonry design and construction (1st revision) BIS, New Delhi.

QUESTION PAPER PATTERN FOR SEE

1. Question Paper shall contain total of eight questions with two from each unit to be set uniformly covering the entire syllabus.
2. Answer any **FIVE** questions selecting at least **ONE** full question from each Unit**.**
3. Each question should not have more than four sub divisions.
4. IS: 1905-1987 code is allowed

Sl. No	Course Outcomes Student will be able to
1	Identify various materials used in masonry, their characteristics and the influence of various parameters on the stability of concentrically loaded masonry walls. Factors influence the compressive strength of masonry.
2	Apply boundary conditions to calculate the effective height, length and thickness of wall in the design of masonry wall and column; Slenderness ratio: Determine the slenderness ratio of walls and reduction factors, to evaluate the permissible stresses.
3	Analyse the reduction of basic compressive strength due to slenderness ratio and eccentricity, elastic buckling of brittle columns.Design of masonry up to three storeys.
4	Design the cavity wall. Design the free-standing walls subjected to wind load perpendicular to plane of wall, and wind load acts in the plane of wall.

COURSE ARTICULATION MATRIX

Course Outcomes	Programme Outcomes												Programme Specific Outcomes		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO 1	2	1	1	1	1	1	1	1				1	2	1	1
CO 2	3	2	2	3	2	2	1					1	1	2	1
CO 3	3	3	3	2	1	3	1	1				2	3	3	2
CO 4	3	3	3	2		2	1	1				2	3	3	2
Average	2.75	2.25	2.25	2.00	1.33	2.00	1.00	1.00	0	0	0	1.50	2.25	2.25	1.50

22UCV531N	**AIR POLLITION AND CONTROL**	Credits: 3
L:T:P - 3 : 0 : 0		CIE Marks: 50
Total Hours/Week: 3		SEE Marks: 50

UNIT-I	**10 Hrs.**
Introduction: Definition, Sources, classification and characterization of air pollutants. Effects of air pollution on health, vegetation & materials. Atmosphere and water bodies, Photo-chemical Smog, .	
UNIT–II	**10 Hrs.**
Meteorology: Temperature lapse rate & stability, wind velocity & turbulence, plume behavior, measurement of meteorological variables, wind rose diagrams, Plume Rise, estimation of effective stack height and mixing depths. Development of air quality models-Gaussian dispersion model and Numerical problems.	
UNIT–III	**10Hrs.**
Sampling: Sampling of particulate and gaseous pollutants (Stack, Ambient & indoor air pollution), Monitoring and analysis of air pollutants ($PM_{2.5}$, PM_{10}, SO_X, NO_X, CO, NH_3) and Air pollution emission standards and Numerical problems	
UNIT–IV	**10 Hrs.**
Control Techniques: Air pollution control devices, equipment and their design. Particulate matter and gaseous pollutants- settling chambers, cyclone separators, scrubbers, filters & ESP. Including Numerical problems. Indoor air quality-sources, types and control of air pollutants	
Reference Books *	
1. M. N. Rao and H V N Rao, "Air pollution", Tata Mc-G raw Hill Publication. 2. H. C. Perkins, "Air pollution". Tata McGraw Hill Publication 3. Mackenzie Davis and David Cornwell," Introduction to Environmental Engineering" McGraw-Hill Co. Noel De Nevers, "Air Pollution Control Engineering" , Waveland Pr Inc. Anjaneyulu Y, "Text book of Air Pollution and Control Technologies", Allied Publishers	
Course Outcomes	
After studying this course, students will be able to: 1. Identify the major sources of air pollution and understand their effects on health and environment. 2. Evaluate the dispersion of air pollutants in the atmosphere and to develop air quality models. 3. Ascertain and evaluate sampling techniques for atmospheric and stack pollutants. 4. Choose and design control techniques for particulate and gaseous emissions	

Course Outcomes	Programme Outcomes												Programme Specific Outcomes		
	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2	PSO3
CO 1	1	2	1								1	1	2		
CO 2	1	1	2								2	1	2		
CO 3	1	2	1								1	1	2		
CO 4	1	1	1								2	1	2		

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22UCV536N	**GREENBUILDING TECHNOLOGY**	**Credits:3**
L:T: P-3:0:0		CIEMarks:50
Total Hours/Week: 3		SEE Marks: 50

UNIT-I	**10 Hrs.**
Introduction of green building, Concept of green building, History of green building, Need of green building in present scenario, Importance of green building Merits and demerits, Classification of green building, Assessment methods Global assessment and certification, Local assessment, LEED (Leadership in energy and environmental design) GRIHA (Green Rating for Integrated Habitat Assessment), IGBC (Indian Green Building Council) and Green star rating systems.	
UNIT–II	**10 Hrs.**
Principles and elements of design of green building; Sustainability: concept and reality Climate responsive process of design: Climatic zones, design sequence, shelter or form, land form, vegetation, water bodies, street widths, open spaces, ground character, plan form, orientation, roof form Shading devices and their effect.	
UNIT–III	**10 Hrs.**
Thermal comfort inside the building: Factors affecting, indices, cooling and heating requirement, Heat transmission through building sections, thermal performance of building sections, simple calculation for U value and insulation thickness Day lighting Ventilation.	
UNIT–IV	**10 Hrs.**
Water conservation: 3 R's for water conservation, rain water harvesting, low flow fixtures, grey water recycling Material conservation: concept of embodied energy, low energy materials, sustainable materials, alternative materials Concept of Carbonemission and its reduction Bureau of energy efficiency: Functions, policies, guidelines, Energy Conservation Building Code, Study of existing green buildings.	
REFERENCEBOOKS**	

1. Climate responsive architecture (A design hand book for energy efficient buildings), Arvind Krishnana, SimosYannas, Nick Baker, S VSzokolay, McGraw hill Education, Seventh reprint, 2013.
2. Renewable Energy and Environment-A Policy Analysis for India, H, Ravindranath, K Usha Rao, B Natarajan, P Monga, Tata McGraw Hill, 2000.Energy and the Environment, JM Fowler, McGraw Hill, New York, 2nd Edition, 1984.IGBC Green Homes Rating System, Version 2.0., Abridged reference guide, 2013, Indian Green Building Council Publishers.
3. GRIHA version 2015, GRIHA rating system, Green Rating for Integrated Habitat Assessment.
4. Non-ConventionalEnergyResourcesbyG.D. Rai,KhannaPublishers.
5. SustainableBuildingDesignManual,Vol.1 and2,TERI,NewDelhi2004.
6. MikeMontoya,GreenBuildingFundamentals, Pearson,USA, 2010.
7. Charles J.Kibert, Sustainable Construction – Green Building Design and Delivery, John Wiley &Sons, New York, 2008.
8. Regina Leffers, Sustainable Construction and Design, Pearson / Prentice Hall, USA, 2009.
9. Handbookonfunctionalrequirementsofbuildings(SP41),BIS,NewDelhi,1987.
10. EnergyConservationbuildingcode(ECBC),Bureauofenergyefficiency,2011.

CourseOutcomes**

Aftercompletion ofthecoursestudentwillbeableto

1. understand, recognize, and evaluate green building's significance, principles, and advantages and disadvantages in sustainable construction.
2. gain a comprehensive understanding of green building design principles and sustainability concepts, with a focus on climate-responsive design processes, shading devices, and their effects on building performance.
3. proficientlyoptimize thermalcomfort, daylighting, and ventilation inbuildings, creating sustainable and comfortable indoor environments.
4. understand and apply water and material conservation techniques, grasp the concept of embodied energy and carbon emissions reduction, and analyze existing green buildings and the role of the Bureau of EnergyEfficiency.

***Booksto belistedaspertheformatwithdecreasinglevelofcoverageofsyllabus**
****EachCO tobewrittenwithproperactionwordandshouldbeassessableand**

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quantifiable

CourseOutcomes	**ProgrammeOutcomes(POs)**												**ProgramSpecific Outcomes (PSOs)**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO1	3	3	-	-	-	2	**3**	**2**	-	-	-	**2**		**2**	
CO2	3	2	-	-	-	1	**3**	**2**	-	-	-	**2**		**2**	
CO3	3	2	-	-	-	-	**3**	**2**	1	-	-	**2**		**2**	
CO4	2	2	-	-	-	1	**3**	**2**	1	-	-	**2**		**2**	

22UBT523C/22UBT623C	Environmental Studies	01 - Credits (1: 0 : 0)
Hours / Week : 01		CIE Marks : 50
Total Hours : 15		SEE Marks : 50

UNIT – 1	04 Hrs.

Natural Resources:

Human activities and their impacts. **Renewable Energy**: Solar energy, Wind energy, Hydropower, Tidal energy, Ocean thermal energy, Geo thermal energy, Biomass energy, Biogas, Biodiesel, Bioethanol, Hydrogen as fuel.

Non renewable Energy: Coal, Petroleum, Natural gas, Nuclear energy.

UNIT – 2	04 Hrs.

Environmental Pollution:

Water pollution, water quality standards, water borne diseases, Fluoride problem, Air pollution, Noise pollution. Effect of electromagnetic waves.

Sustainable future: Concept of sustainable development, threats to sustainability, strategies for sustainable development. Environment economics – concept of green building, clean development mechanism (CDM).

UNIT – 3	03 Hrs.

Current Environmental Issues of concern:

Greenhouse Effect- Greenhouse gases and Global Warming, Climate change, ozone layer depletion, Acid rain, Eutrophication

Environmental policy legislation rules & regulations

UNIT – 4	04Hrs.

Fundamentals of Waste management:

Solid waste management: Sources, classification, characteristics, collection & transportation, disposal, and processing methods. Hazardous waste management and handling.

Concept of waste water treatment, Bioremediation.

Industrial waste management (Case studies: Cement, plastic, chemical, E–waste, food & construction industry waste management).

REFERENCES

1. Benny Joseph “Environmental Studies” Tata McGraw Hill, 2005
2. Dr. D. L. Manjunath, “Environmental Studies” Pearson Education, 2006
3. Koushik and Koushik “Environmental Science & Engineering” New Age International Publishers, New Delhi, 2006
4. Meenakshi “Environmental Science & Engineering” Pranticce Hall of India, 2006

COURSE OUTCOMES

After completion of the course the students shall be able to,

- Ability to recognize natural resources and its uses.
- Able to understand pollution and its effects on environment and to implement sustainable future in the work place.
- Ability to understand current environmental issues.
- Able to apply the waste management techniques in various fields

Course Outcomes	Program Outcomes												Program Specified Outcomes		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO 1	-	**1**	-	-	-	**2**	**3**	-	-	-	-	**3**	**1**	-	-
CO 2	**2**	-	-	-	-	-	**3**	-	-	-	-	**3**	**1**	-	-
CO 3	-	**2**	-	-	-	**2**	**2**	-	-	-	-	**3**	**1**	-	-
CO 4	-	-	-	**1**	-	**2**	**2**	**1**	-		-	**3**	**1**	-	**1**

Question Paper Pattern for SEE:

Question is of Objective type
Duration of exam is 1 hour 30 mins
50 questions covering all the four units. Each question carries one mark

22UHS001M	**YOGA** (COMMON TO ALL BRANCHES)	Credit : 00
L:T:P :0:0:2		CIE Marks : 50
Total Hours Per Semester :26		SEE Marks : 00

Semester	Course
IIISem	1) Introduction of Yoga, Aim and Objectives of yoga,Prayer 2) Brief introduction of yogic practices for common man 3) Rules and regulations 4) Misconceptions of yoga 5) Suryanamaskara 6) Different types of Asanas a. Sitting b. Standing c. Proneline d. Supineline
IVSem	1) Patanjali'sAshtangaYoga 2) Suryanamaskara 3) Different types of Asanas a. Sitting b. Standing c. Proneline d. Supineline Sitting 4) Pranayama 5) Kapalbhati
VSem	1) Patanjali'sAshtangaYoga 2) Suryanamaskara 3) Differenttypes of Asanas a. Sitting b. Standing c. Proneline d. Supineline 4) Kapalbhati 5) Pranayama
VI Sem	1) Patanjali's AshtangaYoga 2) Suryanamaskara 3) Different types of Asanas a. Sitting b. Standing c. Proneline d. Supineline 4) Kapalbhati 5) Pranayama 6) ShatKriyas

Blown-UpSyllabus

Semester	Title	Content	No.of Hours
3rdSemester	Introduction of Yoga, Aim and Objectives of yoga,Prayer	Yoga,itsorigin,history and development.Yoga, its meaning, definitions. Different schools of yoga,importance of prayer	Total 26hrs 2hrs/week
	Brief introduction of yogic practices for commonman	Yogic practices for common man to promote Positive health	
	Rules and regulations	Rules to be followed during yogic practices by practitioner	
	Misconceptions of yoga	Yoga its misconceptions, Difference between yogic and non yogic practices	
	Suryanamaskara	Suryanamaskar prayer and its meaning, Need,importance and benefits of Suryanamaskar 12 count,2 rounds	
	Different types of Asanas a. Sitting 1.Padmasana 2.Vajrasana b. Standing1.Vrikshana 2.Trikonasana c. Proneline1.Bhujangasana 2.Shalabhasana d. Supineline1.Utthitadvipadasana 2.Ardhahalasana	Asana, Need, importance of Asana. Different types of asana. Asana its meaning by name, technique precautionary measures and benefits of each asana	
4thSemester	PatanjaliʼsAshtangaYoga 1. Yama 2. Niyama	PatanjaliʼsAshtangaYoga its need and importance. Yama:Ahimsa,satya,asteya, brahmacarya,aparigraha Niyama:shoucha,santosh,tapa,svaadhyaya,Eshvarapranidhan	Total 26hrs 2hrs/ Week
	Suryanamaskara	Suryanamaskar12count 4rounds	
	Different types of Asanas a. Sitting1.Sukhasana 2.Paschimottanasana b. Standing1.ArdhakatiChakrasana 2. ParshvaChakrasana c. Proneline 1.Dhanurasana d. Supineline1.Halasana 2.KarnaPeedasana	Asana, Need, importance of Asana. Differenttypes of asana.Asana its meaning by name, technique, precautionary measures and benefits of each asana	
	Kapalabhati	Meaning,importance and benefits of Kapalabhati. 40 strokes/min3rounds	
	Pranayama–1. 1. Suryanuloma –Viloma 2. Chandranuloma-Viloma 3. Suryabhedana 4. ChandraBhedana 5. Nadishodhana	Meaning, Need, importance of Pranayama.Differenttypes.Meaning byname,technique,precautionary measures and benefits of each Pranayama	

5thSemester	AshtangaYoga 3.Asana 4.Pranayama 5.Pratyahara 6.Dharana	Patanjali'sAshtangaYogaitsneedandimportance.	Total 26hrs 2hrs/week
	Suryanamaskara	Suryanamaskar 12count 6rounds	
	Different types of Asanas a. Sitting1. ArdhaUshtrasana 2.Vakrasana b. Standing 1.UrdhvaHastothanasana 2.Hastapadasana c. Proneline 1.Padangushtha 2. Dhanurasana d. Supineline 1.Sarvangasana 2.Chakraasana	Asana, Need, importance of Asana. Differenttypes.Asanaitsmeaningbyname,technique,precautionary measures and benefits of eachasana	
	Kapalabhati	Revision of practice 50strokes/min 3rounds	
	Pranayama–1.SuryaBhedana 2.Ujjayi	Meaning, Need, importance of Pranayama.Differenttypes.Meaning byname,technique, Precautionary measures and benefits of each Pranayama	
6th Semester	AshtangaYoga 7.Dhyana(Meditation) 8.Samadhi	Patanjali's Ashtanga Yoga its need and importance.	Total 26hrs2hrs/ week
	Suryanamaskara	Revision of practice 12 count 8 rounds	
	Different types of Asanas a. Sitting1. AakarnaDhanurasana 2.YogamudrainPadmasana b. Standing 1.Parivritta 2.Trikonasana 3.Utkatasana c. Proneline1.PoornaBhujangasana /Rajakapotasana d. Supineline1.Navasana/Noukasana 2.Pavanamuktasana	Asana,Need,importance of Asana. Different types, Asana by name,technique, precautionary erasures and benefits of each asana	
	Kapalabhati	Revision of practice 60 strokes/min 3rounds	
	Pranayama– 1.Sheetali 2.Sheektari 3.Bhastrika 4.Bhramari	Meaning, Need, importance of Pranayama.Different types.Meaning by name, technique, precautionary measures and benefits of each Pranayama	
	ShatKriyas 1. Jalaneti&sutraneti 2. Nouli(onlyformen) 3. SheetkarmaKapalabhati	Meaning, Need, importance of Shatkriya.Differenttypes.Meaningbyname,technique,precautionary measures and benefits of each Kriya	

BookforReference:

1. SwamiKuvulyananda :Asma(Kavalyadhama,Lonavala)
2. Tiwari,OP :AsanaWhyandHow
3. Ajitkumar : YogaPravesha(Kannada)
4. SwamiSatyanandaSaraswati :AsanaPranayama,Mudra,Bandha (BiharSchoolof yoga,Munger)
5. SwamiSatyanandaSaraswati :SuryaNamaskar (BiharSchoolof yoga,Munger)
6. NagendraHR :Theart andscienceofPranayama
7. Tiruka :Shatkriyegalu(Kannada)
8. IyengarBKS :YogaPradipika(Kannada)
9. IyengarBKS :LightonYoga(English)
10. S.K.Kuppasta : Samagra Yoga Darshini(Kannada)

Scheme of Assessment:

WEIGHTAGE	**100%**
	CIE
At the End of 3rd Semester	**25**
At the End of 4th Semester	**25**
At the End of 5th Semester	**25**
At the End of 6th Semester	**25**
TOTALMARKS FOR THECOURSE	**100**

Note: 1. No Semester End Examinations.

22UHS002M	**National Service Scheme** **(NSS)** (COMMON TO ALL BRANCHES)	Credit: 00
L:T:P :0:0:2		CIE Marks : 50
Total Hours Per Semester :26		SEE Marks :00

CorseObjectives:NationalServiceScheme(NSS)willenablethestudentsto:

Course objectives: National Service Scheme (NSS) will enable the students to:

1. Understand the community in general in which they work.
2. Identify the needs and problems of the community and involve them in problem –solving.
3. Develop among themselves a sense of social & civic responsibility & utilize their knowledgein finding practical solutions to individual and community problems.
4. Develop competence required for group-living and sharing of responsibilities & gainin mobilizing community participation to acquire leadership qualities and democratic attitudes.
5. Develop capacity to meet emergencies and natural disasters & practice national integration and social harmony in general.

Contents	26 Hours

1. Organic farming, Indian Agriculture (Past, Present and Future) Connectivity for marketing.

2. Waste management– Public, Private and Govt organization, 5 R's.

3. Setting of the information imparting club for women leading to contribution in social and economic issues.

4. Water conservation techniques – Role of different stakeholders– Implementation.

5. Preparing an actionable business proposal for enhancing the village income and approach for implementation.

6. Helping local schools to achieve good results and enhance their enrolment in Higher/ technical/ vocational education.

7. Developing Sustainable Water management system for rural areas and implementation approaches.

8. Contribution to any national level initiative of Government of India. Foreg. Digital India, Skill India, Swachh Bharat,

Atmanirbhar Bharath, Make in India, Mudra scheme, Skill development programs etc.

9. Spreading public awareness under rural outreach programs.(minimum5 programs).

10. Social connect and responsibilities.

11. Plantation and adoption of plants. Know your plants.

12. Organize National integration and social harmony events /workshops /seminars. (Minimum 02 programs).

13. Govt. school Rejuvenation and helping them to achieve good infrastructure.

NOTE:

- Student/s in individual or in a group Should select any one activity in the beginning of each semester till end of that respective semester for successful completion as per the instructions of NSS officer with the consent of HOD of the department.
- At the end of every semester, activity report should be Submitted for evaluation.

Course outcomes (Course Skill Set):

At the end of the course, the student will be able to:

CO1: Understand the importance of his / her responsibilities towards society.

CO2: Analyse the environmental and societal problems/issues and will be able to design solutions For the same

CO3: Evaluate the existing system and to propose practical solutions for the same for sustainable development.

CO4: Implement government or self-driven projects effectively in the field.

CO5: Develop capacity to meet emergencies and natural disasters & practice national integration and social harmony in general.

ASSESSMENTANDEVALUATIONPATTERN

WEIGHTAGE	**100%**
	CIE
At the End of 3rd Semester	**25**
At the End of 4th Semester	**25**
At the End of 5th Semester	**25**
At the End of 6th Semester	**25**
TOTALMARKS FOR THECOURSE	**100**

Blown-Up Syllabus

Distribution of Activities - Semester wise from 3rd to 6th semester

Semester	Topics / Activities to be Covered
3rd Semester	1. Organic farming, Indian Agriculture (Past, Present and Future) Connectivity for marketing. 2. Waste management– Public, Private and Govt organization, 5 R's. 3. Setting of the information imparting club for women leading to contribution in social and economic issues.
4th Semester	4. Water conservation techniques – Role of different stakeholders– Implementation. 5. Preparing an actionable business proposal for enhancing the village income and approach for implementation. 6. Helping local schools to achieve good results and enhance their enrolment in Higher/ technical/ vocational education.
5th Semester	7. Developing Sustainable Water management system for rural areas and implementation approaches. 8. Contribution to any national level initiative of Government of India. Foreg. Digital India, Skill India, Swachh Bharat, Atmanirbhar Bharath,Make in India, Mudra scheme, Skill development programs etc. 9. Spreading public awareness under rural outreach programs.(minimum5 programs). 10. Social connect and responsibilities.
6th Semester	11. Plantation and adoption of plants. Know your plants. 12. Organize National integration and social harmony events /workshops /seminars. (Minimum 02 programs). 13. Govt. school Rejuvenation and helping them to achieve good infrastructure.

Sl No	Topic	Group size	Location	Activity execution	Reporting	Evaluation Of the Topic
1.	Organic farming, Indian Agriculture (Past, Present and Future) Connectivity for marketing.	May be individual or team	Farmers land/Villages/ roadside/ community area/ College campus etc…..	Site selection /proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
2.	Waste management– Public, Private and Govt organization, 5 R's.	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	Site selection /proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
3.	Setting of the information imparting club for women leading to contribution in social and economic issues.	May be individual or team	Women empowerment groups/ Consulting NGOs & Govt Teams / College campus etc…..	Group selection/proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
4.	Water conservation techniques – Role of different stakeholders– Implementation.	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	site selection / proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
5.	Preparing an actionable business proposal for enhancing the village income and approach for implementation.	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	Group selection/proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
6.	Helping local schools to achieve good results and enhance their enrolment in Higher/ technical/ vocational	May be individual or team	Local government / private/ aided schools/Government Schemes officers/ etc…..	School selection/proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer

	education.					
7.	Developing Sustainable Water management system for rural areas and implementation approaches.	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	site selection/proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
8.	Contribution to any national level initiative of Government of India. For eg. Digital India, Skill India, Swachh Bharat, Atmanirbhar Bharath, Make in India, Mudra scheme, Skill development programs etc.	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	Group selection/proper consultation/Continuous monitoring / Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
9.	Spreading public awareness under rural outreach programs.(minimum5 programs). ///// Social connect and responsibilities.	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	Group selection/proper consultation/Continuous monitoring / Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
10.	Plantation and adoption of plants. Know your plants.	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	Place selection/proper consultation/Continuous monitoring / Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
11.	Organize National integration and social harmony events /workshops /seminars. (Minimum 02 programs).	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	Place selection/proper consultation/Continuous monitoring / Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer

12.	Govt. school Rejuvenation and helping them to achieve good infrastructure.	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	Place selection/proper consultation/Continuous monitoring / Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer

Pedagogy – Guidelines, it may differ depending on local resources available for the study as well as environment and climatic differences as well as location time of execution.

Plan of Action (Execution of Activities For Each Semester)

Sl.NO	Practice Session Description
1	**Lecture session by NSS Officer**
2	**Students Presentation on Topics**
3	**Presentation - 1 ,Selection of topic, PHASE - 1**
4	**Commencement of activity and its progress - PHASE - 2**
5	**Execution of Activity**
6	**Execution of Activity**
7	**Execution of Activity**
8	**Execution of Activity**
9	**Execution of Activity**
10	**Case study based Assessment, Individual performance**
11	**Sector wise study and its consolidation**
12	**Video based seminar for 10 minutes by each student At the end of semester with Report.**

22UHS003M	**PHYSICAL EDUCITION ANDSPORTS**	Credit: 00
L:T:P :0:0:2	**(PE)**	CIE Marks: 50
Total Hours Per Semester :26	(COMMON TO ALL BRANCHES)	SEE Marks: 00

Semester	**Course**
IIISem	FitnessComponents Kabaddi/KhoKho
IVSem	Athletics Volleyball/Throwball /Football/Netball/Basketball
V Sem	Athletics Hockey /Cricket/Baseball
VISem	IndividualGames Handball/Badminton

Blown-Up Syllabus

Semester	CourseTitle	Content	No.ofHours
3rdSem	**FitnessComponents** SpeedStrengthEnduranceAgilityFlexibility.	Meaning and Importance, Fit India Movement, Definition of fitness, Components of fitness, Benefits of fitness, Types of fitness and Fitness tips. ***PracticalComponents:Speed,Strength,Endurance,Flexibility,andAgility***	Total26 hrs2hrs/ week
	KHOKHO	**A.Fundamentalskills** 1. Skills in Chasing : Siton the box (Parallel &Bullettoe method),Getup from the box(Proximal & Distal foot method),GiveKho(Simple,Early,Late&Judgment),Pole Turn,Pole Dive,Tapping, Hammering, Rectification of foul. 2. Skills in running: Chain Play, Ring play and Chain & Ring mixed play. 3. Game practice with application of Rules and Regulations. **B. Rules and their interpretations and duties of the officials.**	
	KABADDI	**A.Fundamentalskills** 1. Skills in Raiding: Touching with hands, Use of leg-toe touch,squatlegthrust,sidekick,mulekick,arrowflykick, crossing of baulk line. Crossing of Bonus line. 2. Skills of holding the raider: Various formations, catching From particular position, different catches, catching formation and techniques. 3. Additional skills in raiding : Escaping from various holds, Techniques of escaping from chain formation, of fense and defense. 4. Game practice with application of Rules and Regulations. **B.Rules and their interpretations and duties of the of ficials**	

4thSem	**AthleticsTrack-**Sprints **Jumps-** LongJump **Throws-**ShotPut	**TrackEvents** Starting Techniques: Standing start and Crouch start(its variations)use of Starting Block. Acceleration with proper running techniques. Finishing technique: RunThrough, Forward Lunging and Shoulder Shrug. **Long Jump**: ApproachRun,Take-off,Flight in the air(HangStyle/HitchKick)andLanding **Shotput:**Holding the Shot,Placement, InitialStance,Glide, Delivery Stanceand Recovery(PerryO'BrienTechnique	Total26hrs
	AthleticsTrack- 110&400MtrsHurdles **Jumps-**HighJump **Throws-**DiscussThrow	**110Mtrsand 400Mtrs:** HurdlingTechnique:LeadlegTechnique,TraillegTechnique,SideHurdling,Over the Hurdles Crouch start(itsvariations)use of Starting Block. Approach to First Hurdles, InBetween Hurdles,LastHurdlestoFinishing. **Highjump**:ApproachRun,Take-off,BarClearance(Straddle)and Landing. **DiscusThrow**:Holding the Discus, InitialStancePrimarySwing,Turn, ReleaseandRecovery(Rotationinthecircle).	2hrs/week
	VOLLEYBALL	**A.Fundamentalskills** 1. Service:Underarmservice,Side armservice,Tennisservice,Floatingservice. 2. Pass:Underarmpass, Overhead pass. 3. SpikingandBlocking. 4. GamepracticewithapplicationofRulesandRegulations **B.Rulesandtheirinterpretationanddutiesofofficials.**	
	THROWBALL	A. **Fundamentalskills:** Overhandservice,Sidearmservice,twohandcatching,onehandoverheadreturn,sidearmreturn. B. **Rulesandtheirinterpretationsanddutiesof officials**	
	FOOTBALL	**A. FundamentalSkills** 1. Kicking: Kicking the ball with inside of the foot, Kicking theball with Full Instepofthefoot, Kickingtheball with InnerInstep ofthefoot,KickingtheballwithOuterInstep ofthefootandLoftedKick. 2. Trapping:Trapping- theRollingball,andtheBouncingballwith soleofthefoot. 3. Dribbling:Dribblingtheballwith Instepofthefoot, DribblingtheballwithInnerandOuterInstepofthefoot. 4. Heading:Instanding,runningandjumpingcondition. 5. Throw-in:Standingthrow-inandRunningthrow-in. 6. Feinting:Withthelowerlimbandupperpartofthebody. 7. Tackling:SimpleTackling,SlideTackling. 8. GoalKeeping:CollectionofBall,Ballclearance-kicking,throwinganddeflecting. 9. GamepracticewithapplicationofRulesandRegulations. **B. Rulesandtheirinterpretationanddutiesofofficials.**	

	BASKETBALL	**A. FundamentalSkills** 1. Passing:TwohandChestPass, TwohandsBounce Pass,OnehandBaseballPass,SidearmPass,Overhead Pass,HookPass. 2. Receiving:Twohandreceiving,Onehandreceiving, Receivinginstationaryposition,Receivingwhile JumpingandReceivingwhileRunning. 3. Dribbling:Howtostartdribble,dropdribble,High Dribble,LowDribble,ReverseDribble,Rolling Dribble. 4. Shooting:Lay-upshot anditsvariations,One hand Setshot,Two handsjumpshot,Hookshot,FreeThrow. 5. Rebounding:DefensivereboundandOffensiverebound. 6. IndividualDefence:Guardingtheplayerwiththeball andwithouttheball,Pivoting. 7. Gamepracticewith applicationofRulesandRegulations. **B. Rulesandtheirinterpretation and dutiesofofficials**	
	NETBALL	**A. Fundamentalskills** 1. Catching: onehanded,twohanded,with feetgroundedand inflight. 2. Throwing (Different passes and their uses): One hand passes (shoulder,highshoulder,underarm,bounce,lob), twohandpasses(Push,overheadandbounce). 3. Footwork:Landingononefoot,landingontwofeet,Pivot,Runningp ass. 4. Shooting:Onehand,forwardstepshot,andbackwardstepshot. 5. Techniquesof freedodgeandsprint,suddensprint, sprintandstop,sprintingwithchangeatspeed. 6. Defending:Markingtheplayer,markingtheball, blocking,insidethecircle,outsidethecircle. thecircleedgeagainstthepassing. 7. Intercepting:Passandshot. 8. Gamepracticewith applicationofRulesandRegulations. **B. Rulesandtheirinterpretation anddutiesofofficials**	

5thSem	**AthleticsTrack-** Relays **Jumps**-Triple Jump**Throws-** JavelinThrow	**RelayRace**:Starting,BatonHolding/Carrying,BatonExchangeinbetweenzone,andFinishing **TripleJump**:ApproachRun,Take-off,FlightintheHop,Step,JumpandLanding **Javelin Throw**: Grip, Carry, and Recovery (3/5 Impulse stride).Release	Total26hrs 2hrs/week
	Athletics Combined Events-Heptathlon & Decathlon **Jumps**- Pole Vault **Throws**-HammerThrow	CombinedEvents:Heptathlonallthe7events Decathlon:All10Events **PoleVault**:ApproachRun,PlantingthePole,Take-off,BarClearanceandLanding. **HammerThrow**:HoldingtheHammer,InitialStancePrimary Swing,Turn,ReleaseandRecovery(Rotationinthecircle).	
	HOCKEY	**A.FundamentalSkills** 1.Passing:Short pass,Longpass, pushpass, hit 2. Trapping. 3.DribblingandDozing. 4. Penaltystrokepractice. 5. Penaltycornerpractice. 6. Tackling:SimpleTackling,SlideTackling. 7. GoalKeeping,Ballclearance-kicking,anddeflecting. 8. GamepracticewithapplicationofRulesandRegulations. **B.Rulesandtheirinterpretationanddutiesofofficials.**	
	CRICKET	**A.FundamentalSkills** **1.**Batting-ForwardDefenseStroke,BackwardDefenseStroke, OffDrive,On Drive,Straight Drive,CoverDrive,SquareCut. **2.**Bowling-Out-swing,In-swing,OffBreak,LegBreakandGoogly. **3.**Fielding: Catching - The High Catch, The Skim Catch, The Close Catch andthrowingatthestumpsfromdifferent angles.LongBarrierandThrow,ShortThrow,Long Throw,ThrowingontheTurn. **4.**WicketKeeping **B.Rulesandtheirinterpretationanddutiesofofficials**	
	BASEBALL	**A. FundamentalSkills** PlayerStances– walking,extendingwalking,Lstance,catstanceGrip –standardgrip,chokegrip Batting – swing and bunt.Pitching Baseball:slider,fast pitch,curveball,dropball,riseball,changeup,knuckleball,screwball, **Rulesandtheirinterpretationand dutiesofofficials.**	

6thSem	**IndividualGames** **SHUTTLEBADMINTON**	**A. Fundamentalskills** 1. BasicKnowledge:VariouspartsoftheRacketandGrip. 2. Service:Shortservice,Long service,Long-highservice. 3. Shots:Overheadshot,Defensiveclearshot,Attacking clearshot,Dropshot,Netshot,Smash. 4. Gamepracticewith applicationofRulesandRegulations. **B. Rulesand theirinterpretationsanddutiesoftheofficials.**	Total26hrs 2hrs/week
	TABLETENNIS	**A. Fundamentalskills** 1. BasicKnowledge:VariouspartsoftheRacketandGrip (ShakeHand&PenHoldGrip). 2. Stance:Alternate&Parallel. 3. PushandService:Backhand &Forehand. 4. Chop:Backhand&Forehand. 5. Receive:PushandChopwithboth Backhand&Forehand. 6. Gamepracticewith applicationofRulesandRegulations. **Rulesand theirinterpretationsanddutiesofthe Officials**	
	HANDBALL	**A.FundamentalSkills** 1. Catching,ThrowingandBall control, 2. Goal Throws:Jumpshot,Centershot,Diveshot,Reverseshot. 3. Dribbling:Highandlow. 4. Attackandcounterattack,simplecounterattack,counter attackfromtwowingsandcenter. 5. Blocking,GoalKeepingandDefensiveskills. 6. Gamepracticewith applicationofRulesandRegulations. **B.Rulesandtheirinterpretation anddutiesofofficials**	
	BALLBADMINTON	**A. Fundamentalskills** 1. BasicKnowledge:VariouspartsoftheRacketandGrip. 2. Service:Shortservice,Long service,Long-highservice. 3. Shots:Overheadshot,Defensiveclearshot,Attacking clearshot,Dropshot,Netshot,Smash. 4. Gamepracticewith applicationofRulesandRegulations. **B.Rulesandtheirinterpretation anddutiesofofficials**	

Scheme of Assessment:

WEIGHTAGE	**100%**	**(100%)**
	CIE	CIE
At the End of 3rd Semester	**20**	**25**
At the End of 4th Semester	**20**	**25**
At the End of 5th Semester	**20**	**25**
At the End of 6th Semester	**20**	**25**
Written assignment/Quiz/Report writing/	**20**	**-**
TOTALMARKS FOR THECOURSE	**100**	**100**

Basaveshwar Engineering College, Bagalkote

B.E–3rd Year Scheme of Teaching and Examinations

(2022-23 Admitted Batch)

VI Semester — Branch: Civil Engineering

Sl. No.	Course			Teaching Department	Teaching hours and Scheme of Evaluation						
	Category	Code	Title		Lecture	Tutorial	Practical/ Drawing	CIE Marks	SEE Marks	Total Marks	Credits
					L	T	P				
1.	PCC	22UCV601C	Design of RC Structures	Civil Engineering	3	0	0	50	50	100	3
2.	PCC	22UCV602C	Water Resources Engineering	Civil Engineering	2	0	0	50	50	100	2
3.	PCC	22UCV603C	Estimation and Costing	Civil Engineering	3	0	0	50	50	100	3
4.	PCC	22UCV604C	Wastewater Engineering	Civil Engineering	2	0	0	50	50	100	2
5.	PEC	22UCV6XXE	Professional Elective Course-II	Civil Engineering	3	0	0	50	50	100	3
6.	OEC	22UCV6XXN	Open Elective Course-II	Respective Department	3	0	0	50	50.	100	3
7.	PCC	22UCV607L	Software Application Lab	Civil Engineering	0	0	2	50	50	100	1
8.	Project	22UCV608P	Extensive Survey Project	Civil Engineering	0	0	4	50	50	100	2
9	HSS	21UHS600C	Indian Knowledge System	Humanities	1	0	0	50	50	100	1
10	MC	22UHS001M/ 22UHS002M 22UHS003M 22UHS004M	NSS/Yoga/PE/Music	Humanities	-	-	-				0
					18	**0**	**6**	**450**	**450**	**900**	**20**

Professional Elective Course-II					Open Elective–II				
Code	Title	L	T	P	Code	Title	L	T	P
22UCV615E	Highway Geometric Design	3	0	0	22UCVXXXN	Energy efficient buildings	3	0	0
22UCV625E	Numerical Techniques in Civil Engineering	3	0	0	22UCV637N	Disaster Management and Mitigation	3	0	0
22UCV635E	Geomorphology	3	0	0	22UCV633N	Public Health Engineering	3	0	0
22UCV645E	Advance Concrete Technology	3	0	0	22UCVXXXN	Occupational Health and Safety	3	0	0
22UCV655E	Irrigation Engineering	3	0	0					

BVV Sangha's
Basaveshwar Engineering College, Bagalkot
Civil Engineering Department

22UCV601C	DESIGN OF RC STRUCTURES	Credits: 3
L:T:P - 3 : 0: 0		CIE Marks: 50
Total Hours/Week: 3		SEE Marks: 50

UNIT-I	11 Hrs

General features reinforced concrete: Introduction, Design loads, Materials for reinforced concrete, Code requirements of reinforcements, Elastic theory of RC sections, Moment of resistance of section, Balanced, under reinforced and over reinforced section.

Principles of limit state design and ultimate strength of RC section: Philosophy of Limit state design, Principles of limit states, Factor of safety, Characteristic and design loads, Characteristic and design strength, General aspects of ultimate strength, Stress block parameters for limit state of collapse, Ultimate flexural strength of rectangular sections, Ultimate flexural strength of flanged sections, Ultimate flexural strength of doubly reinforced sections, Ultimate shear strength of RC sections, Ultimate torsional strength of RC sections, Concepts of development length and anchorage, Analysis examples for rectangular sections, flanged sections, doubly reinforced, sections, shear strength and development length.

UNIT–II	11 Hrs.

Limit state: General aspects, Deflection limits in IS: 456-2000, Calculation of deflection (Theoretical method), Cracking Serviceability in structural concrete members. Design of beams: Practical requirements of an RCC beam, Size of the beam, Cover to the Reinforcement, Spacing of bars, Design procedure, Critical sections for moments and

Shear, Anchorage of bars: check for development length, Reinforcement requirements, Slenderness limits for beams to ensure lateral stability, Design examples for simply supported and cantilever beams (rectangular).

UNIT–III	09 Hrs.

Design of slabs: Introduction, General consideration of design of slabs, Rectangular slabs spanning in one direction, Rectangular slabs spanning in two directions for various boundary conditions, Design of simply supported slabs, cantilever slabs.

Design of stair case: General features, types of stair case, Loads on stair cases, effective span as per IS codal provisions, distribution of loading on stairs, design of stair cases.

UNIT–IV	09 Hrs.

Design of columns: General aspects, Effective length, Loads on columns, Slenderness limits for columns, Minimum eccentricity, Design of short axially loaded columns, Design of column subject to combined axial load and uniaxial moment using SP 16.

Design of footings: Introduction, Load for foundation, Design basis (limit state method), Design of isolated square or rectangular footing for axial load.

Reference Books *

1. Unnikrishnan and Devadas Menon, Design of reinforced concrete structures, PHI, New Delhi. 2013.
2. Karve S.R. and Shah V.L, Limit state theory and design of reinforced concrete, Vidyarthi Prakashan, Pune. 2017.
3. A.K. Jain, Limit state method of design, Nemchand and Bros, Roorikee, Jan 2012.
4. Park and Paulay, Reinforced concrete, John Wiley & Sons. 1975.
5. Kong and Evans, Reinforced and prestressed concrete, ELBS, London
6. H.J. Shah, Reinforced concrete Vol. I, Charotor Publishing House, Anand. Jan 2016.
7. IS: 456-2000, SP-24, SP-16.

(Note: Use of IS: 456-2000 is permitted and SP-16 to be used in design of columns only).

BVV Sangha's
Basaveshwar Engineering College, Bagalkot
Civil Engineering Department

Course Outcomes**
After completion of the course student will be able to 1. Students will have the knowledge of methods of design of RC sections & will analyse the different RCsections. 2. Students will be able to solve the problems related to serviceability conditions and design different beamsections. 3. Students will be able to design different slab and staircase. 4. Students will be able to design columns and isolated footings.

***Books to be listed as per the format with decreasing level of coverage of syllabus**
**** Each CO to be written with proper action word and should be assessable and quantifiable**

Course Outcomes	**Programme Outcomes**												**Programme Specific Outcomes**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO 1	3	3											2	1	
CO 2	3	3											2	2	
CO 3	3	3	3	3									2	2	
CO 4	3			2									2	1	
Average	3	3	3	2.5									2	1.5	

22UCV602C	Water Resources Engineering	Credits: 2
L:T:P - 2 : 0: 0		CIE Marks: 50
Total Hours/Week: 2		SEE Marks: 50

UNIT-I	7 Hrs

Hydrology: Introduction, Importance of hydrology, Global distribution of water and Indian water availability, Practical application of hydrology, Hydrologic cycle (Horton's) qualitative and engineering representation

Precipitation: Definition, Forms and types of precipitation, measurement of rain fall using Symon's and Syphon type of rain gauges, optimum number of rain gauge stations, consistency of rainfall data (double mass curve method), computation of mean rainfall (Arithmetic average and Isohyetal methods only), estimation of missing data, mass curve, rainfall hyetographs.

UNIT–II	8 Hrs.

Losses: Evaporation: Introduction, Process, factors affecting evaporation, measurement using IS class-A Pan, estimation using empirical formulae, Reservoir evaporation and control

Evapo-transpiration: Introduction, Consumptive use, AET, PET, Factors affecting, Measurement, Estimation by Blaney- Criddle equation

Infiltration: Introduction, factors affecting infiltration capacity, measurement by double ring infiltrometer, Horton's infiltration equation, infiltration indices

UNIT–III	8 Hrs.

Runoff: Definition, concept of catchment, Runoff process, factors affecting runoff, Rainfall –Runoff relation.

Hydrographs: Definition, components of hydrograph, base flow separation, unit hydrograph, assumption, application and limitations, Conversion of UH of different durations

UNIT–IV	7 Hrs.

Reservoirs: Definition, investigation for reservoir site, storage zones determination of storage capacity using mass curves, economical height of dam.

Gravity Dams: Criteria for selection of dam sites, forces acting on dams, Types of loads, Modes of failure, Elementary profile of a gravity dam, Galleries (theoretical discussion only)

Reference Books *

Textbooks:

1. K. Subramanya, "Engineering Hydrology", Tata McGraw Hill Publishers, New Delhi.
2. Jayarami Reddy, "A Text Book of Hydrology", Lakshmi Publications, New Delhi.
3. Punmia and LalPandey, "Irrigation and Water Power Engineering" Lakshmi Publications, New Delhi.

Reference Books:

1. H.M. Raghunath, "Hydrology", Wiley Eastern Publication, New Delhi.
2. Sharma R.K., "Irrigation Engineering and Hydraulics", Oxford & IBH Publishing Co., New Delhi.
3. VenTe Chow, "Applied Hydrology", Tata McGraw Hill Publishers, New Delhi.
4. Modi P.N "Water Resources and Water Power Engineering"-. Standard book house, Delhi.

Course Outcomes**
After studying this course, students will be able to: 1. Understand the importance of hydrology, its components, and precipitation analysis. 2. Estimate runoff, develop unit hydrographs, and analyze precipitation losses. 3. Evaluate the benefits and ill effects of irrigation, including water requirements for crops. 4. Design canals, compute reservoir capacity, and determine canal capacity.

Question paper pattern:

The question paper will have ten full questions carrying equal marks.
Each full question will be for 20 marks.
There will be two full questions (with a maximum of four sub- questions) from each module.
Each full question will have sub- question covering all the topics under a module.
The students will have to answer five full questions, selecting one full question from each module.

Course Outcomes	**Programme Outcomes**												**Programme Specific Outcomes**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO 1	3	3	2			3		2				1		1	3
CO 2	3	3	2			3		2				1		2	3
CO 3	3	3	3	3		3		2				1		2	3
CO 4	3	2		2		3		2				1		1	3
Average	3	3	3	2.5		3		2				1		1.5	3

22UCV603C	**ESTIMATION & COSTING**	Credits:3
L:T:P 3 :0:0		CIE Marks:50
Total Hours/Week:3		SEE Marks:50

UNIT-I	**10 Hrs.**

Estimate: Different types of estimates, study of various drawing attached with estimates. Important terms, units of measurement, abstract, approximate methods of estimating building, cost from materials and labour equations recommended by CBRI examples.

Estimation: Methods of taking out quantities and cost center line method, long and short wall method. Preparation of detailed and abstract estimates for the following Civil Engineering works Buildings Masonry structures and framed structures with flat, sloped RCC roofs. Building components (Beams, Columns and Column Footings, RCC Roof Slabs).

UNIT-II	**10 Hrs.**

Estimates: Steel truss (Fink and Howe truss), RCC Slab culverts, manhole and septic tanks.

Specifications: Definition of specifications, objective of writing specifications, essentials in specifications, general and details specifications of items.

UNIT-III	**10 Hrs.**

Rate analysis: Definition and purpose. Working out quantities and rates for the following standard items of works earth work in different types of soils, cement concrete of different mixes, bricks and stone masonry, flooring, plastering, RCC works, centering and form work for different RCC items, wood and steel works for doors, windows and ventilators.

Measurement of earthwork for roads: Methods for computation of earthwork cross sections mid section formula, trapezoidal or average end area or mean sectional are formula, prismoidal formula for different terrains.

UNIT-IV	**10 Hrs.**

Contracts: Types of contracts essentials of contract agreement legal aspects, penal provisions on breach of contract. Definition of the terms tender, earnest money deposit, security deposit, tender forms, tender documents and types.

Departmental procedures: comparative statements, acceptance of contract document and issue of work orders. Duties and liabilities, termination of contract, completion certificate, quality control, rights of contractor, refund of deposit. Administrative approval technical sanction, Nominal Muster roll, measurement Books procedure for recording and checking measurements preparation of bills of works in buildings,

specifications of items of works in building, specifications of aluminum and wooden partitions, false ceiling, aluminum and fiber doors and window, various types of claddings.

Valuation: Definitions of terms used in valuation process, Purpose of valuation, Cost, Estimate, Value and its relationship, Capitalized value. Freehold and leasehold and easement,

Reference Books *

1. B. N. Datta, "Estimating & Costing"UBS Publishers and Distributors, New Delhi, Jan2016.
2. N.Chakraborthy, "Estimating & Costing, Specification & Valuation in Civil Engg", Published by author,Calcutta,Jan2006.
3. S. C. Rangwala "Estimating & Specifications", Charotar Publishing House, Anand, 17thEdition:(reprint) Jan2017.
4. G. S. Birdie "Estimating & Costing", Dhanpathi Rai publishing company Pvt., NewDelhi.Jan2014.

Course Outcomes**

1. The students at the end of the course will be capable of applying different methods of estimate, CBRI formulae for the building estimate.
2. Estimating cost of load bearing/ framed structures by long wall/ short wall and central line methods.
3. Estimating cost of the truss, culverts and septic tanks. Detailed specifications of the different items of civil works.
4. Finding the item rates of the different items of civil works. Working the earth work for the roads by different methods. Carrying out the civil works as per PWD forms.

COURSEARTICULATIONMATRIX

Course Outcomes	Programme Outcomes												Programme Specific Outcomes		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	2	2	3	3	-	-	-	-	-	2	2	2	2
CO2	3	2	1	1	2	2	-	-	-	-	-	2	2	2	2
CO3	3	2	2	2	3	2	-	-	-	-	-	2	2	2	2
CO4	3	3	2	2	3	2	-	-	-	-	-	2	2	2	2
Average	3	2.5	1.75	1.75	2.75	2.25	-	-	-	-	-	2	2	2	2

22UCV604C	WASTEWATER ENGINEERING	**Credits: 2**
L:T:P - 2 : 0: 0		CIE Marks: 50
Total Hours/Week: 2		SEE Marks: 50

UNIT-I	**6 Hrs.**

Introduction: Necessity for sanitation, Sewerage systems and their suitability.

Estimation of Wastewater Flows: Dry weather flow, factors affecting, Flow variations and their effects on design of sewerage system, Numerical problems. Computation of sewage and storm water discharge, Numerical problems.

Design of Sewers: Self cleansing and non-scouring velocities, Numerical problems. Laying of sewers, joints and testing of sewers, ventilation and cleaning of sewers.

UNIT–II	**7 Hrs.**

Sewer Appurtenances: Catch basin, manholes, flushing tanks, oil and grease traps, Drainage traps. Basic principles of house drainage. Typical layout plan showing house drainage connections, maintenance of house drainage.

Sewage Characteristics: Sewage Sampling. Physical, Chemical and Biological characteristics, with emphasis on BOD & COD, BIS and CPCB standards, Numerical problems.

UNIT–III	**6 Hrs.**

Sewage Treatment - Primary Treatments: Flow diagram of municipal wastewater treatment plant. Primary treatment Screening, grit chambers, skimming tanks, primary sedimentation tanks- Theory and Design.

Secondary Treatments: Fixed film bioprocess-Trickling filter theory, modifications and design. Suspended growth system-Activated sludge process-Theory and design**.**

UNIT–IV	**7 Hrs.**

Sludge Treatment Methods: Sludge digestion tanks, Sludge drying beds. Low cost wastewater treatment -Septic tank, Oxidation Pond and Oxidation ditches, Numerical problems**.**

Sewage Disposal: Dilution method - self-purification phenomenon. Streeter-Phelps equation, Oxygen sag curve, Zones of purification. Land disposal: Sewage farming, sewage sickness, Numerical Problems.

Reference Books *

1. Environmental Engineering, Peavy H. S., Rowe D. R. and George Tchobanoglous, McGraw-Hill International.
2. Garg, S.K., "Environmental Engineering", Vol. 1 & II Khanna Publishers, New Delhi, 2005.
3. Water Supply and Sewerage, McGhee T. J., McGraw-Hill Inc.,
4. Wastewater Engineering Treatment and Reuse, Metcalf & Eddy, McGraw Hill Education, 2017, 4th Edition.

5. APHA, Standard Methods Examination of Water and Wastewater, American Public Health Association, Washington DC, 1995.
6. CPCB, Guide Manual: Water and Wastewater Analysis.

Course Outcomes**

After completion of the course student will be able to

1. To estimate sewage and drainage quantity, for the design of sewers and drainage sections.
2. To demonstrate the characterization of sewage and sewer appurtenances.
3. To identify the impact of sewage disposal on water and land and minimum treatment necessary for sewage.
4. To design biological treatment units for sewage and knowledge of sludge disposal.

*** Books to be listed as per the format with decreasing level of coverage of syllabus**

**** Each CO to be written with proper action word and should be assessable and quantifiable**

Course Outcomes	Programme Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	1	1	3	3	-	-	-	-	2	2	3	3
CO2	3	-	-	3	2	3	3	-	-	-	-	1	3	2	3
CO3	2	2	1	2	2	3	3	-	-	-	-	2	2	2	2
CO4	3	3	3	2	2	2	3	-	-	-	-	1	3	3	3

22UCV607L	SOFTWARE APPLICATION LAB	Credits: 1
L:T:P-0:0:2		CIE Marks: 50
Total Hours/Week: 2		SEE Marks:50

MICROSOFT EXCEL: Analysis and design of singly beam, doubly beam, one way and two way slabs.

ANALYSIS AND DESIGN SOFTWARES: Analysis and Design of structural Engineering components using commercially available Software's: Cantilevers, Simply supported beams, Propped Cantilevers, Fixed and Continuous Beams. 2D Portal frames - Single and two storied.

AUTOCAD: Drawing and detailing: singly Beam, doubly beam, one way slab, two way slab, doglegged stair case and isolated footing with column.

Reference Books: Training manuals and User manuals and Relevant course reference books

Course Outcomes: After studying this course, students will be able to

1. Utilize Excel for analyzing and designing singly reinforced beams, doubly reinforced beams, one-way, and two-way slabs.
2. Analyze and design structural components like cantilevers, simply supported beams, propped cantilevers, fixed and continuous beams, and 2D portal frames using commercial software.
3. Create detailed structural drawings for beams, slabs, staircases, and isolated footings with columns using AutoCAD.
4. Apply computational tools to enhance accuracy and efficiency in structural analysis, design, and detailing

Course Outcomes	Programme Outcomes											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	3	3	-	3	-	-	-	-	-	-	1
CO2	3	3	3	-	3	-	-	-	-	-	-	1
CO3	3	3	3	-	3	-	-	-	-	-	-	1
CO4	3	3	3	-	3	-	-	-	-	-	-	1
Total	3	3	3	-	3	-	-	-	-	-	-	1

22UCV608P	**EXTENSIVE SURVEY PROJECT**	Credits: 2
L:T:P - 0 : 2 : 2		CIE Marks: 50
Total Hours/Week: 4		SEE Marks: 50

1. **NEW TANK PROJECTS:** The work shall consist of**;**
   a. Reconnaissance survey for selection of site and conceptualization of project.
   b. Alignment of Centre line of the proposed bund, Longitudinal and cross sections of the centre line.
   c. Detailed survey required for project execution like Capacity surveys, Details at Waste weir and sluice points, Canal alignment etc. as per requirement
   d. Design and preparation of drawing with report.

2. **WATER SUPPLY AND SANITARY PROJECT:** The work shall consist of**;**

a. Reconnaissance survey for selection of site and conceptualization of project.
b. Examination of sources of water supply, Calculation of quantity of water required based on existing and projected population.
c. Preparation of village map by using total station.
d. Survey work required for laying of water supply and UGD pipelines
e. Location of sites for water tank. Selection of type of water tank to be provided(ground level, overhead and underground)
f. Design of all elements and preparation of drawing with report.

3. **HIGHWAY PROJECT:** The work shall consist of;

a. Reconnaissance survey for selection of site and conceptualization of project.
b. Preliminary and detailed investigations to align a new road (min. 1.5 to 2 km stretch) between two obligatory points. The investigations shall consist of topographic surveying of strip of land for considering alternate routes and for final alignment. Surveying by using conventional instruments and total station.
c. Report should justify the selected alignment with details of all geometric designs for traffic and design speed assumed.
d. Drawing shall include key plan, alignment, longitudinal section along alignment, typical cross sections of road.

GENERAL INSTRUCTIONS

1. To be conducted between 5th & 6th Semester for a period of 2 weeks including training on total station.
2. Viva voce conducted along with 6th semester exams.
3. An extensive project preparation training involving investigation, collection of data is to be conducted. Use of Total Station is compulsory for minimum of TWO projects.

EXAMINATION

1. The student shall submit a project report consisting of designs and drawings.
2. Drawings should be done using CAD and survey work using total station.
3. Students should learn data download from total station, generation of contours, block levelling, longitudinal and cross sectional diagrams, and capacity volume calculation by using relevant software.

EVALUATION FOR CIE (FOR 50 MARKS)

1. Field work : 12.5Marks
2. Office work (Design and drawing): 12.5Marks
3. Presentation of the prepared report: 12.5Marks
4. Final report submission: 12.5Marks

EVALUATION FOR SEE (FOR 50 MARKS)

1. Presentation of the prepared report: 37.5Marks
2. Viva: 12.5Marks

Course Outcomes

1. Apply various surveying methods, including total station, GPS, and traditional instruments, to collect precise field data.
2. Perform leveling, contouring, and route surveys for highways, railways, and irrigation projects.
3. Process survey data to create maps, profiles, and layouts for engineering applications using software tools.
4. Work in teams to conduct extensive fieldwork, ensuring accuracy, efficiency, and adherence to surveying standards

COURSE ARTICULATION MATRIX

Course Outcomes	Programme Outcomes												Programme Specific Outcomes		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO 1	3	1	2	-	3	1	1	-	3	2	2	2	3	2	2
CO 2	3	3	3	2	3	3	3	2	3	3	3	2	3	3	3
CO 3	1	2	-	-	-	1	-	2	3	3	2	3	3	1	3
CO 4	3	3	3	2	3	3	3	2	3	3	3	2	3	3	3
Average	2.5	2.25	2	1	2.25	2	1.75	1.5	3	2.75	2.5	2.25	3	2.25	2.75

22UCV615E	Highway Geometric Design	Credits: 3
L:T:P - 3 : 0: 0		CIE Marks:50
Total Hours/Week: 3		SEE Marks:50

UNIT-I	10Hrs.

INTRODUCTION: Geometric control factors like Topography- design speed- design vehicle- Traffic- Capacity- volume- environmental & other factors as per IRC & AASHTO standards & specifications- PCU concepts- factors controlling PCU for different design purpose.

CROSS SECTIONAL ELEMENTS: Pavement surface characteristics- friction- skid resistance- pavement unevenness- light reflecting characteristics-camber-objectives-types of camber- method of providing cambers in the field- problems- carriage way- kerb- median- shoulder- foot path- parking lanes- service roads- cycle tracks- Driveways- Right of way- Factors influencing right of way- Design of Road humps as per latest IRC provision.

UNIT–II	10 Hrs.

SIGHT DISTANCE: Importants, types, SSD, OSD & Sight distances at uncontrolled intersections, derivations, factors affecting sight distance, IRC, AASHTO standards, problems on above.

HORIZONTAL ALIGNMENT: Definition, Checking the stability of vehicle, while moving on horizontal curve, Super elevation, Ruling minimum & maximim radius, Assumptions- problems- methods of providing super elevation for different curves- Extra widening of pavement on curves- Objectives- Mechanical widening- Psychological widening- Transition curve- Objectives- Ideal requirments- Types of transition curves- Method of evaluating length of transition curve- Setting the transition curve in the field, set back distance on horizontal curve & problems on above.

UNIT–III	10 Hrs.

VERTICAL ALIGNMENT: Gradient- Types of gradient- Design criteria of summit & valley curve- Design of vertical curves based on SSD-OSD-Night visibility considerations-Design standards for hilly roads- problems on the above.

INTERSECTION DESIGN: Principle- At grade & Grade separated junctions- Types- Channelization- Features of channelizing Island- Median opening- Gap in median at junction

UNIT–IV	10 Hrs.

ROTARY INTERSECTIONS: Elements- Advantages- Disadvantages- Design guide lines- problem on above- Grade seperated intersection- Three legged intersection- Diamond interchange- Half clover leaf- Clover leaf- Advantages- Disadvantages only

HIGHWAY DRINAGE: Importance – sub surface drinage- surface drinage- Design of road side drives- Hydrological- Hydraulic considerations and design of filter media, problems on above.

Reference Books *

1. Khanna, S.K. and Justo, C.E.G., "Highway Engineering", Nem Chand & Bros. 2004
2. Papacostas, C.S. and Prevedouros, P.D., "Transportation Engineering and Planning", Prentice Hall. 2002
3. JotinKhisty, C. and Kent Lall, B., "Transportation Engineering – An Introduction", Third edition, Pearson India 2016
4. K. Subramaniam, "Transportation Engineering", SciTech Publications, Chennai.
5. Relevant Indian Roads Congress Codes –
6. C. Jotin Khisty, B. Kentlal, "Transportation Engineering", PHI Learning Pvt. Ltd. New Delhi.
7. Right, Paul H. and Dixon, Karen K., "Highway Engineering", John Wiley and Sons Inc. 2004

Course Outcomes**
Describe various geometric elements like speed, topography, traffic volume, Design hourly, traffic volume etc.
Determine the various sight distances, evaluate extra widening required for horizontal curves
Design and setting out of Summit and Valley curves and describe different types of at-grade, grade separated intersection and channelization.
Design Rotary intersection, surface and subsurface drainage system.

***Books to be listed as per the format with decreasing level of coverage of syllabus**

****** Each CO to be written with proper action word and should be assessable and quantifiable**

Course Outcomes	**Programme Outcomes (POs)**												**Program Specific Outcomes (PSOs)**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO1		1		**1**							1		1		
CO2					1				1					1	
CO3						1	**1**				1				1
CO4										1		1		1	

BVV Sangha's
Basaveshwar Engineering College, Bagalkot
Department Civil Engineering

22UCV625E	NUMERICAL TECHNIQUES IN CIVIL ENGINEERING	Credits: 3
L:T:P - 3 : 0: 0		CIE Marks: 50
Total Hours/Week: 3		SEE Marks: 50

UNIT-I	10Hrs

Introduction: Historical development of numerical techniques, Role in investigations, research, and design in the field of Civil Engineering. Application of Solution of Linear System of Equations to Civil Engineering Problems.

Development of simultaneous equations from problems in construction planning, slope deflection method applied to beams frames and truss analysis using Gaussian elimination method, Gauss-Jordan matrix inversion method, Gauss- Siedel method, Cholesky decomposition method.

UNIT–II	10 Hrs.

Application of Root Finding to Civil Engineering Problems: Development of non-linear algebraic and transcendental equations from problems in hydraulics, irrigation engineering, structural engineering and environmental engineering using Bisection method and Newton-Raphson method.

Application of Numerical Integration for Solving Simple Beam Problems

Computation of area of BMD drawn for statically determinate beams by Trapezoidal rule and Simpson's one third rule.

UNIT–III	10 Hrs.

Application of Solution of Ordinary Differential Equation to Civil Engineering Problems. Application of solution of ODE by Euler's method and Runge-Kutta 4^{th} order method in statically determinate problems, problems in Environmental engineering, problems in Hydraulics and Geotechnical engineering.

UNIT–IV	10 Hrs.

Application of Finite Difference Techniques in Structural Mechanics:

I. Introduction, expression of derivatives by finite difference, backward differences, forward differences and central differences.

II. Application of finite difference method to analysis of Statically determinate beams, statically indeterminate beams, Buckling of columns.

Reference Books

1. J B Scarborough- Numerical Mathematical Analysis, 6th edition, Oxford and IBH New Delhi, 2005.
2. Mario Salvadori- Numerical Methods in Engineering, PHI, 1961.
3. M.K Jain, S R K Iyengar and R.K. Jain- Numerical Methods for Scientific and Engineering computation, New Publications, New Delhi,2012.
4. S S Sastry- Introductory Methods of Numerical Analysis, 5th edition, PHI, New Delhi, 2012.
5. E Balagurusamy - Numerical Methods, Tata Mc Graw Hill, 2017.
6. H C Saxena - Examples in Finite Differences and Numerical Analysis, S Chand & Co. New Delhi, 1975.

BVV Sangha's
Basaveshwar Engineering College, Bagalkot
Department Civil Engineering

Course Outcomes**
After completion of the course student will be able to 1. Solve linear systems of equations related to civil engineering problems using Gauss elimination, Gauss-Seidel, Gauss-Jordan matrix inversion, and Cholesky decomposition methods. Evaluate air pollutant dispersion in the atmosphere and develop air quality models. 2. Determine the roots of nonlinear algebraic and transcendental equations in civil engineering applications using the bisection and Newton-Raphson methods. 3. Solve ordinary differential equations related to civil engineering problems using Euler's method, Euler's modified method, and the Runge-Kutta method. 4. Apply the finite difference method to solve differential equations for determinate and indeterminate beams, as well as for analyzing column buckling. .

***Books to be listed as per the format with decreasing level of coverage of syllabus**
**** Each CO to be written with proper action word and should be assessable and quantifiable**

Course Outcomes	**Programme Outcomes**												**Programme Specific Outcomes**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
CO 1	3	3											2	1	1
CO 2	3	3											2	1	1
CO 3	3	3	3	3									1	1	1
CO 4	3			2									2	2	1
Average	3	3	3	2.5									1.75	1.25	1

BASAVESHWAR ENGINEERING COLLEGE, BAGALKOTE

DEPARTMENT OF CIVIL ENGINEERING

VI SEMESTER DEPARTMENT ELECTIVE SYLLABUS

Department	Civil Engineering		Semester	VI
Subject Code	22UCV635E	Subject	GEOMORPHOLOGY	
Faculty	Prof. S. M. Kalagudi			
Teaching Hours (L : T : P)	3: 0 : 0	Total No. of teaching hours	40	
CIE Marks	50	SEE Marks	50	

Course description:

This course focuses on the origin/evolution of landforms and the physical processes responsible for their creation and modification.

Course outcomes: After the completion of this course, students should be able to:

1. Define the field of Geomorphology, its basic principles and interior of earth.
2. To outline the mechanism and theories of dynamic nature of the Earth.
3. To illustrate the geomorphic processes, agents and their effects on the earth.
4. To explain the conceptual and dynamic aspects of landform development

Unit -1 (10 hours)

INTRODUCTION:

Introduction to Geomorphology- Definition meaning, nature, development and scope; Basic concepts; Geological Time Scale; Distribution of continents and oceans; Internal structure of the earth.

UNIT- II (10 hours)

EARTH MOVEMENTS:

Epierogenic and Orogenic earth movements; Theories of continental drift , plate tectonics, sea floor spreading, Isostasy ,Earthquakes, volcanoes and their distribution.

UNIT- III (10 hours)

GEOMORPHIC PROCESSES AND AGENTS:

Constructive and destructive processes: exogenetic and endogenetic processes and agents. Agents of Denudation: River; Drainage patterns, Groundwater, Sea Waves, Wind and Glaciers. Weathering, erosion and mass wasting.

UNIT- IV (10 hours)

EVOLUTION OF LANDFORMS:

Meaning, types and factors controlling landforms development. Slope development; concept and types, Concept of Cycle of Erosion–W.M. Davis and W. Penck. Erosional and depositional landforms made by wind, rivers, glaciers and underground water. Application of geomorphology.

References:
1. Ahmed E. (1985) Geomorphology, Kalyani Publishers, New Delhi.
2. Strahler A.N. (1968) The Earth Sciences, Harper & Row Intl. Edn, New York
3. Thornberry W.D. (1969) Principles of Geomorphology 2nd Edition, Wiley International Edn. & Wiley Eastern Reprints 1984.
4.Verstappen H. (1983) Applied Geomorphology, Geomorphological Surveys for Environmental Development, Elsevier, Amsterdam
5.Woodridge S.W and R.S. Morgan (1991) An Outline of Geomorphology, The Physical Basis of Geography, Orient Longman, Kolkata.
6. Dayal P. (1995) A Text Book of Geomorphology 2nd Edition. Sukla Book/Dept. Patna.
7. Homes A. (1965) Principles of Physical Geology, 3rd Edition, ELBSS Edn.
8. Goudie Anrew et.al. (1981) Geomorphological Techniques, George Allen & Unwin,London.
9. Bloom A.L. (1978) Geomorphology: A Systematic Analysis of Late Cenozoic Landforms Prentice Hall of India, New Delhi.
10. Brunsden D. (1985) Geomorphology in the Service of Man: The Future of Geography, Methnen, U.K.
11. Worcester P.G. (1965), A Text Book of Geomorphology, Can North and 2nd Edition, East West Edn. New Delhi.
12. 13. William D. Thornbury(2004). Principles of Gomorphology,
13. William D. Thornbury(2004). Principles of Gomorphology, 2nd Edition, CBS Publisher and Distributor Pvt. Ltd, New Delhi
14. Vishwas S. Kale, Avijit Gupta (2018), Introduction to Geomorphology, Universities Press.

Websites:

1.http://www.solarviews.com/eng/earth.htm
2.http://www.moorlandschool.co.uk/earth/tectonic.htm
3.https://www.gsi.gov.in/webcenter/portal/OCBIS
4. https://www.usgs.gov/ 5. https://www.moes.gov.in/

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO12	PSO1	PSO2	PSO3
1							2					1		1	
2							2					1		2	
3							1					1		1	
4							1					1		2	

22UHS600C	**Indian Knowledge Systems** (Common to All Branches)	**Credit:01**
Hrs/Week: 1:0:0		**CIE Marks:**50
Total Hours: 15Hrs		**SEE Marks:**50

Course Objectives:

1. To provide a general introduction to Indian Knowledge System (IKS)
2. To sensitize the students to the contributions made by ancient Indians in the field of Science, Philosophy and related applications and concepts.

UNIT - I	**3Hrs**
Indian Knowledge Systems (IKS) Overview, Vedic Corpus, Philosophy, Character, scope and importance, traditional knowledge vis-a-vis Indigenous knowledge, traditional knowledge vs. western knowledge.	
UNIT – II	**4Hrs**
Traditional Knowledge in Mathematics and Humanities Introduction to Indian Mathematics, Unique aspects of Indian Mathematics, Indian Mathematicians and their Contribution. Number Systems and Units of Measurement. Linguistics, Art, Craft and Trade in India, Number Systems and Units of Measurement	
UNIT - III	**4Hrs**
Traditional Knowledge in Physics and Chemistry Measurements for time, distance and weight, Astronomy, Indian contributions in astronomy, Astrology, The celestial coordinate system, Elements of the Indian calendar, Notion of years and month, Panchanga – The Indian calendar system, Metals and Metalworking: The rise and fall of a great Indian technology, Mining and ore extraction, Zinc extraction, Copper and it's alloys, Iron and steel in ancient India	
UNIT - IV	**4Hrs**
Traditional Knowledge in Professional domain Town Planning and Architecture, Agriculture, Governance and Public Administration, United Nations Sustainable development goals	

Reference books:

1. Mahadevan, B., Bhat Vinayak Rajat, Nagendra Pavana R.N. "Introduction to Indian Knowledge System: Concepts and Applications", PHI Learning Private Ltd. Delhi (2022**).** Pride of India: A Glimpse into India's Scientific Heritage, Samskrita Bharati, New Delhi.
2. Sampad and Vijay "The Wonder that is Sanskrit", Sri Aurobindo Society, Puducherry. (2011).
3. Acarya, P.K. Indian Architecture, Munshiram Manoharlal Publishers, New Delhi. (1996).
4. Kapoor Kapil, Singh Avadhesh "Indian Knowledge Systems Vol – I & II", Indian Institute of Advanced Study, Shimla, H.P. (2021).
5. Dasgupta,S. A History of Indian Philosophy- Volume 1, Motilal Banarsidass, New Delhi. (1975).
6. PLofker, K. (1963). Mathematics in India, Princeton University Press, New Jeresy, USA"

Suggested Web Links:

1. https://www.youtube.com/watch?v=LZP1StpYEPM
2. http://nptel.ac.in/courses/121106003/

3.http://www.iitkgp.ac.in/department/KS;jsessionid=C5042785F727F6EB46CBF432D7683B63 (Centre of Excellence for Indian Knowledge System, IIT Kharagpur)

4. https://www.wipo.int/pressroom/en/briefs/tk_ip.html
5. https://unctad.org/system/files/official-document/ditcted10_en.pdf

6. http://nbaindia.org/uploaded/docs/traditionalknowledge_190707.pdf
developmentgoals/?gclid=EAIaIQobChMInpJtb_p8gIVTeN3Ch2
7. https://unfoundation.org/what-we-do/issues/sustainable-developmentgoals/?gclid=EAIaIQobChMInp-Jtb_p8gIVTeN3Ch27LAmPEAAYASAAEgIm1vD_BwELAmPEAAYASAAEgIm1vD_BwE

Course Outcomes:

At the end of the course student will be able to:

CO1: Provide an overview of the concept of the Indian Knowledge System and its importance

CO2: Appreciate the need and importance of protecting traditional knowledge.

CO3: Recognize the relevance of Traditional knowledge in different domains.

CO4: Establish the significance of Indian Knowledge systems in the contemporary world.

Course Outcomes	Programme Outcomes											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	2	-	-	-	-	-	-	3	-	-	-	1
CO2	-	-	-	-	-	2	-	-	-	-	-	-
CO3	-	-	2	2	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	3	2	-	-	-	-	-

22UCV633N	**PUBLIC HEALTH ENGINEERING**	Credits: 03
L:T:P - 3 : 0 : 0		CIE Marks: 50
Total Hours/Week: 3		SEE Marks: 50

UNIT-I	10 Hrs.

Introduction: Water: Need for protected water supply, Demand of Water: Types of water demands – domestic demand, industrial, institutional and commercial demand, public use and fire demand estimation, factors affecting per capita demand, Variations in demand of water, Peak factor. Numericals

Design period and factors governing design period. Methods of population forecasting and numerical problems. Physico-chemical characteristics of water ,Numerical

UNIT–II	10 Hrs.

Water Treatment: Objectives, Unit flow diagrams – significance of each unit, Aeration process Limitations and types, Sedimentation – Theory, settling tanks, types and design with numericals, Coagulation and flocculation, types of coagulants, Filtration: mechanism, theory of filtration, types of filters: slow sand, rapid sand and pressure filters. Operation and cleaning. Design of slow and rapid sand filter without under drainage system Numericals

UNIT–III	10Hrs.

Disinfection: Methods of disinfection with merits and demerits. Breakpoint of chlorination Softening: Lime soda and Zeolite process. Wastewater: Introduction: Need for sanitation, methods of sewage disposal, types of sewerage systems, Treatment of municipal wastewater: Wastewater characteristics sampling, significance and techniques, physical, chemical and biological characteristics, Numericals on BOD

UNIT–IV	10 Hrs.

Treatment Process: flow diagram for municipal wastewater treatment unit operations and process Screens: types, disposal. Grit chamber, oil and grease removal. primary and secondary settling tanks (no numerical), Suspended growth system – conventional activated sludge process and its modifications

Reference Books *

- Howard S. Peavy, Donald R. Rowe, George T, "Environmental Engineering" - Tata McGraw Hill, New York, Indian Edition, 2013
- S. K. Garg, Environmental Engineering vol-I, Water supply Engineering – M/s Khanna Publishers, New Delhi2010
- B.C. Punmia and Ashok Jain, Environmental Engineering I-Water Supply Engineering, Laxmi Publications (P) Ltd., New Delhi2010.
- B C Punmia, "Environmental Engineering vol-II", Laxmi Publications 2nd, 2016
- Karia G.L., and Christian R.A, "Wastewater Treatment Concepts and Design Approach" , Prentice Hall of India Pvt. Ltd., New Delhi. 3rd, Edition, 2017
- S.K.Garg, "Environmental Engineering vol-II, Water supply Engineering", Khanna Publishers, – New Delhi, 28th edition and 2017

Course outcomes:

At the end of the course the student will be able to :

- Estimate average and peak water demand for a community.
- Evaluate water quality and environmental significance of various parameters and plan suitable treatment system.

- Design the different units of water treatment plant
- Understand and design the various units of wastewater treatment plant

Course Outcomes	Programme Outcomes												Programme Specific Outcomes		
	1	2	3	4	5	6	7	8	9	10	11	12	PSO1	PSO2	PSO3
CO 1	1	2	1								1	1	2		
CO 2	1	1	2								2	1	2		
CO 3	1	2	1								1	1	2		
CO 4	1	1	1								2	1	2		

Public Health Engineering (PHE) is the discipline that focuses on designing and implementing systems and infrastructure that provide safe and clean water supply, efficient sewage and effective wastewater disposal. In the context of buildings, PHE engineering ensures that residents and occupants have access to clean and potable water, hygienic sanitation facilities, and a healthy environment

The specific objectives are to enable students to:

• be aware of the importance of environmental sanitation and interventions to prevent spread of infectious / communicable diseases,

• Understand water and wastewater quality characteristics and their importance in ensuring good public health as well as environmental protection,

• be aware of the various factors affecting the choice of sanitation systems and to plan and design onsite and off-site sanitation technology options in any given situation (rural, urban, semi/peri-urban areas, low-lying areas; rocky and collapsing formations; the poor, middle income and the rich) as well as treatment systems for excreta, wastewater and grey water,

• choose appropriate sanitation and drinking water treatment units and processes for solving problems (i.e. improving sanitation and water supply) in communities,

• understand how natural self-purification processes impact on water quality and the environmental factors that can be manipulated to improve the situation.

22UCV637N	DISASTER MANAGEMENT AND MITIGATION	**Credits: 3**
L:T:P - 3 : 0: 0		CIEMarks:50
Total Hours/Week: 3		SEEMarks:50

UNIT-I	**08 Hrs.**

Introduction: Concepts and definitions: disaster, hazard, vulnerability, resilience, risks severity, frequency , capacity, impact, prevention, mitigation. India's natural disaster proneness and disaster prone zones

UNIT–II	**10 Hrs.**

Disasters classification : natural disasters (floods, draughts, cyclones, volcanoes, earthquakes, tsunamis . landslides etc.); manmade disasters(industrial pollution, artificial flooding in urban areas, nuclear radiation, transportation accidents,terrorist strikes, etc.)

UNIT–III	**10 Hrs.**

Disaster Impacts and Mitigation measures: Disaster impacts (environmental, physical, social, ecological, economic,

political, etc.); health, psycho-social issues; demographic aspects (gender, age, special needs);

hazard locations; global and national disaster trends; climate change and urban disasters; mitigation measures and case studies of common disasters .

UNIT–IV	**12 Hrs.**

Disaster Risk Reduction (DRR) - Disaster management cycle – its phases; prevention, mitigation, preparedness, relief and recovery; structural and non-structural measures; risk analysis, vulnerability and capacity assessment; early warning systems, Importance of disaster education and community awareness and preparedness in disaster management. Roles and responsibilities of citizens, technology, media, community, government and non government organizations in disaster management;Policies and legislation for disaster risk reduction; Disaster management system in India.

Reference Books *

1. R. Subramanian, 2021, Disaster Management, Vikas publishing house Pvt. Ltd., Noida, India.
2. A.K. Srivastava, 2021, Text book of Disaster Management, Scientific publishers, India.
3. Tushar Bhattacharya, 2012,Disaster science and Management, Tata McGraw Hill publications, New Delhi, India.
4. Pradeep Sahni, 2004, Disaster Risk Reduction in South Asia, Prentice Hall.
5. Singh B.K., 2008, Handbook of Disaster Management: Techniques and Guidelines, RajatPublication.
6. Ghosh G.K., 2006, Disaster Management, APH Publishing Corporation.

Jagbir Singh, 2007, Disaster Management, I.K International Publishing House, New Delhi.

7. Vinod.K.Sharma, 2013,Disaster Management, second Edn., Scientific International Pvt. Ltd., New Delhi,India.
8. Carter.W.Nick, 1991, Disaster Management: A Disaster Manager's Hand book, Asia Development Bank, Manila.
9. Government of India website on Disaster Management : www.ndmindia.nic.in

Course Outcomes**

After completion of the course student will develop competencies in:

CO1:the application of disaster Concepts to management

CO2: analysing relationship between development and disasters.

CO3:ability to understand Categories of disasters.

CO4:realization of the responsibilities to society

***Books to be listed as per the format with decreasing level of coverage of syllabus**

****** Each CO to be written with proper action word and should be assessable and quantifiable**

Course Outcomes	Programme Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	2	-	2	2	-	-	-	-	-	-			
CO2	3	2	3	-	2	1	-	-	-	-	-	-			
CO3	3	2	3	-	3	-	-	-	1	-	-	-			
CO4	2	1	1	-	2	1	-	-	1	-	-	1			

22UHS001M	**YOGA** (COMMON TO ALL BRANCHES)	Credit : 00
L:T:P :0:0:2		CIE Marks : 50
Total Hours Per Semester :26		SEE Marks : 00

Semester	Course
IIISem	1) Introduction of Yoga, Aim and Objectives of yoga,Prayer 2) Brief introduction of yogic practices for common man 3) Rules and regulations 4) Misconceptions of yoga 5) Suryanamaskara 6) Different types of Asanas a. Sitting b. Standing c. Proneline d. Supineline
IVSem	1) Patanjali'sAshtangaYoga 2) Suryanamaskara 3) Different types of Asanas a. Sitting b. Standing c. Proneline d. Supineline Sitting 4) Pranayama 5) Kapalbhati
VSem	1) Patanjali'sAshtangaYoga 2) Suryanamaskara 3) Differenttypes of Asanas a. Sitting b. Standing c. Proneline d. Supineline 4) Kapalbhati 5) Pranayama
VI Sem	1) Patanjali's AshtangaYoga 2) Suryanamaskara 3) Different types of Asanas a. Sitting b. Standing c. Proneline d. Supineline 4) Kapalbhati 5) Pranayama 6) ShatKriyas

Blown-UpSyllabus

Semester	Title	Content	No.of Hours
3rdSemester	Introduction of Yoga, Aim and Objectives of yoga,Prayer	Yoga,itsorigin,history and development.Yoga, its meaning, definitions. Different schools of yoga,importance of prayer	Total 26hrs 2hrs/week
	Brief introduction of yogic practices for commonman	Yogic practices for common man to promote Positive health	
	Rules and regulations	Rules to be followed during yogic practices by practitioner	
	Misconceptions of yoga	Yoga its misconceptions, Difference between yogic and non yogic practices	
	Suryanamaskara	Suryanamaskar prayer and its meaning, Need,importance and benefits of Suryanamaskar 12 count,2 rounds	
	Different types of Asanas a. Sitting 1.Padmasana 2.Vajrasana b. Standing1.Vrikshana 2.Trikonasana c. Proneline1.Bhujangasana 2.Shalabhasana d. Supineline1.Utthitadvipadasana 2.Ardhahalasana	Asana, Need, importance of Asana. Different types of asana. Asana its meaning by name, technique precautionary measures and benefits of each asana	
4thSemester	PatanjaliʼsAshtangaYoga 1. Yama 2. Niyama	PatanjaliʼsAshtangaYoga its need and importance. Yama:Ahimsa,satya,asteya, brahmacarya,aparigraha Niyama:shoucha,santosh,tapa,svaadhyaya,Eshvarapranidhan	Total 26hrs 2hrs/ Week
	Suryanamaskara	Suryanamaskar12count 4rounds	
	Different types of Asanas a. Sitting1.Sukhasana 2.Paschimottanasana b. Standing1.ArdhakatiChakrasana 2. ParshvaChakrasana c. Proneline 1.Dhanurasana d. Supineline1.Halasana 2.KarnaPeedasana	Asana, Need, importance of Asana. Differenttypes of asana.Asana its meaning by name, technique, precautionary measures and benefits of each asana	
	Kapalabhati	Meaning,importance and benefits of Kapalabhati. 40 strokes/min3rounds	
	Pranayama–1. 1. Suryanuloma –Viloma 2. Chandranuloma-Viloma 3. Suryabhedana 4. ChandraBhedana 5. Nadishodhana	Meaning, Need, importance of Pranayama.Differenttypes.Meaning byname,technique,precautionary measures and benefits of each Pranayama	

5thSemester	AshtangaYoga 3.Asana 4.Pranayama 5.Pratyahara 6.Dharana	Patanjali'sAshtangaYogaitsneedandimportance.	Total 26hrs 2hrs/week
	Suryanamaskara	Suryanamaskar 12count 6rounds	
	Different types of Asanas a. Sitting1. ArdhaUshtrasana 2.Vakrasana b. Standing 1.UrdhvaHastothanasana 2.Hastapadasana c. Proneline 1.Padangushtha 2. Dhanurasana d. Supineline 1.Sarvangasana 2.Chakraasana	Asana, Need, importance of Asana. Differenttypes.Asanaitsmeaningbyname,technique,precautionary measures and benefits of eachasana	
	Kapalabhati	Revision of practice 50strokes/min 3rounds	
	Pranayama–1.SuryaBhedana 2.Ujjayi	Meaning, Need, importance of Pranayama.Differenttypes.Meaning byname,technique, Precautionary measures and benefits of each Pranayama	
6th Semester	AshtangaYoga 7.Dhyana(Meditation) 8.Samadhi	Patanjali's Ashtanga Yoga its need and importance.	Total 26hrs2hrs/ week
	Suryanamaskara	Revision of practice 12 count 8 rounds	
	Different types of Asanas a. Sitting1. AakarnaDhanurasana 2.YogamudrainPadmasana b. Standing 1.Parivritta 2.Trikonasana 3.Utkatasana c. Proneline1.PoornaBhujangasana /Rajakapotasana d. Supineline1.Navasana/Noukasana 2.Pavanamuktasana	Asana,Need,importance of Asana. Different types, Asana by name,technique, precautionary erasures and benefits of each asana	
	Kapalabhati	Revision of practice 60 strokes/min 3rounds	
	Pranayama– 1.Sheetali 2.Sheektari 3.Bhastrika 4.Bhramari	Meaning, Need, importance of Pranayama.Different types.Meaning by name, technique, precautionary measures and benefits of each Pranayama	
	ShatKriyas 1. Jalaneti&sutraneti 2. Nouli(onlyformen) 3. SheetkarmaKapalabhati	Meaning, Need, importance of Shatkriya.Differenttypes.Meaningbyname,technique,precautionary measures and benefits of each Kriya	

BookforReference:

1. SwamiKuvulyananda :Asma(Kavalyadhama,Lonavala)
2. Tiwari,OP :AsanaWhyandHow
3. Ajitkumar : YogaPravesha(Kannada)
4. SwamiSatyanandaSaraswati :AsanaPranayama,Mudra,Bandha (BiharSchoolof yoga,Munger)
5. SwamiSatyanandaSaraswati :SuryaNamaskar (BiharSchoolof yoga,Munger)
6. NagendraHR :Theart andscienceofPranayama
7. Tiruka :Shatkriyegalu(Kannada)
8. IyengarBKS :YogaPradipika(Kannada)
9. IyengarBKS :LightonYoga(English)
10. S.K.Kuppasta : Samagra Yoga Darshini(Kannada)

Scheme of Assessment:

WEIGHTAGE	**100%**
	CIE
At the End of 3rd Semester	**25**
At the End of 4th Semester	**25**
At the End of 5th Semester	**25**
At the End of 6th Semester	**25**
TOTALMARKS FOR THECOURSE	**100**

Note: 1. No Semester End Examinations.

22UHS002M	**National Service Scheme** **(NSS)** (COMMON TO ALL BRANCHES)	Credit: 00
L:T:P :0:0:2		CIE Marks : 50
Total Hours Per Semester :26		SEE Marks :00

CorseObjectives:NationalServiceScheme(NSS)willenablethestudentsto:

Course objectives: National Service Scheme (NSS) will enable the students to:

1. Understand the community in general in which they work.
2. Identify the needs and problems of the community and involve them in problem –solving.
3. Develop among themselves a sense of social & civic responsibility & utilize their knowledgein finding practical solutions to individual and community problems.
4. Develop competence required for group-living and sharing of responsibilities & gainin mobilizing community participation to acquire leadership qualities and democratic attitudes.
5. Develop capacity to meet emergencies and natural disasters & practice national integration and social harmony in general.

Contents	26 Hours

1. Organic farming, Indian Agriculture (Past, Present and Future) Connectivity for marketing.

2. Waste management– Public, Private and Govt organization, 5 R's.

3. Setting of the information imparting club for women leading to contribution in social and economic issues.

4. Water conservation techniques – Role of different stakeholders– Implementation.

5. Preparing an actionable business proposal for enhancing the village income and approach for implementation.

6. Helping local schools to achieve good results and enhance their enrolment in Higher/ technical/ vocational education.

7. Developing Sustainable Water management system for rural areas and implementation approaches.

8. Contribution to any national level initiative of Government of India. Foreg. Digital India, Skill India, Swachh Bharat,

Atmanirbhar Bharath, Make in India, Mudra scheme, Skill development programs etc.

9. Spreading public awareness under rural outreach programs.(minimum5 programs).

10. Social connect and responsibilities.

11. Plantation and adoption of plants. Know your plants.

12. Organize National integration and social harmony events /workshops /seminars. (Minimum 02 programs).

13. Govt. school Rejuvenation and helping them to achieve good infrastructure.

NOTE:

- Student/s in individual or in a group Should select any one activity in the beginning of each semester till end of that respective semester for successful completion as per the instructions of NSS officer with the consent of HOD of the department.
- At the end of every semester, activity report should be Submitted for evaluation.

Course outcomes (Course Skill Set):

At the end of the course, the student will be able to:

CO1: Understand the importance of his / her responsibilities towards society.

CO2: Analyse the environmental and societal problems/issues and will be able to design solutions For the same

CO3: Evaluate the existing system and to propose practical solutions for the same for sustainable development.

CO4: Implement government or self-driven projects effectively in the field.

CO5: Develop capacity to meet emergencies and natural disasters & practice national integration and social harmony in general.

ASSESSMENTANDEVALUATIONPATTERN

WEIGHTAGE	**100%**
	CIE
At the End of 3rd Semester	**25**
At the End of 4th Semester	**25**
At the End of 5th Semester	**25**
At the End of 6th Semester	**25**
TOTALMARKS FOR THECOURSE	**100**

Blown-Up Syllabus

Distribution of Activities - Semester wise from 3rd to 6th semester

Semester	Topics / Activities to be Covered
3rd Semester	1. Organic farming, Indian Agriculture (Past, Present and Future) Connectivity for marketing. 2. Waste management– Public, Private and Govt organization, 5 R's. 3. Setting of the information imparting club for women leading to contribution in social and economic issues.
4th Semester	4. Water conservation techniques – Role of different stakeholders– Implementation. 5. Preparing an actionable business proposal for enhancing the village income and approach for implementation. 6. Helping local schools to achieve good results and enhance their enrolment in Higher/ technical/ vocational education.
5th Semester	7. Developing Sustainable Water management system for rural areas and implementation approaches. 8. Contribution to any national level initiative of Government of India. Foreg. Digital India, Skill India, Swachh Bharat, Atmanirbhar Bharath,Make in India, Mudra scheme, Skill development programs etc. 9. Spreading public awareness under rural outreach programs.(minimum5 programs). 10. Social connect and responsibilities.
6th Semester	11. Plantation and adoption of plants. Know your plants. 12. Organize National integration and social harmony events /workshops /seminars. (Minimum 02 programs). 13. Govt. school Rejuvenation and helping them to achieve good infrastructure.

Sl No	Topic	Group size	Location	Activity execution	Reporting	Evaluation Of the Topic
1.	Organic farming, Indian Agriculture (Past, Present and Future) Connectivity for marketing.	May be individual or team	Farmers land/Villages/ roadside/ community area/ College campus etc…..	Site selection /proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
2.	Waste management– Public, Private and Govt organization, 5 R's.	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	Site selection /proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
3.	Setting of the information imparting club for women leading to contribution in social and economic issues.	May be individual or team	Women empowerment groups/ Consulting NGOs & Govt Teams / College campus etc…..	Group selection/proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
4.	Water conservation techniques – Role of different stakeholders– Implementation.	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	site selection / proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
5.	Preparing an actionable business proposal for enhancing the village income and approach for implementation.	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	Group selection/proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
6.	Helping local schools to achieve good results and enhance their enrolment in Higher/ technical/ vocational	May be individual or team	Local government / private/ aided schools/Government Schemes officers/ etc…..	School selection/proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer

	education.					
7.	Developing Sustainable Water management system for rural areas and implementation approaches.	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	site selection/proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
8.	Contribution to any national level initiative of Government of India. For eg. Digital India, Skill India, Swachh Bharat, Atmanirbhar Bharath, Make in India, Mudra scheme, Skill development programs etc.	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	Group selection/proper consultation/Continuous monitoring / Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
9.	Spreading public awareness under rural outreach programs.(minimum5 programs). ///// Social connect and responsibilities.	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	Group selection/proper consultation/Continuous monitoring / Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
10.	Plantation and adoption of plants. Know your plants.	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	Place selection/proper consultation/Continuous monitoring / Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer
11.	Organize National integration and social harmony events /workshops /seminars. (Minimum 02 programs).	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	Place selection/proper consultation/Continuous monitoring / Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer

12.	Govt. school Rejuvenation and helping them to achieve good infrastructure.	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc…..	Place selection/proper consultation/Continuous monitoring / Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by NSS officer

Pedagogy – Guidelines, it may differ depending on local resources available for the study as well as environment and climatic differences as well as location time of execution.

Plan of Action (Execution of Activities For Each Semester)

Sl.NO	Practice Session Description
1	**Lecture session by NSS Officer**
2	**Students Presentation on Topics**
3	**Presentation - 1 ,Selection of topic, PHASE - 1**
4	**Commencement of activity and its progress - PHASE - 2**
5	**Execution of Activity**
6	**Execution of Activity**
7	**Execution of Activity**
8	**Execution of Activity**
9	**Execution of Activity**
10	**Case study based Assessment, Individual performance**
11	**Sector wise study and its consolidation**
12	**Video based seminar for 10 minutes by each student At the end of semester with Report.**

22UHS003M	**PHYSICAL EDUCITION ANDSPORTS**	Credit: 00
L:T:P :0:0:2	**(PE)**	CIE Marks: 50
Total Hours Per Semester :26	(COMMON TO ALL BRANCHES)	SEE Marks: 00

Semester	**Course**
IIISem	FitnessComponents Kabaddi/KhoKho
IVSem	Athletics Volleyball/Throwball /Football/Netball/Basketball
V Sem	Athletics Hockey /Cricket/Baseball
VISem	IndividualGames Handball/Badminton

Blown-Up Syllabus

Semester	CourseTitle	Content	No.ofHours
3rdSem	**FitnessComponents** SpeedStrengthEnduranceAgilityFlexibility.	Meaning and Importance, Fit India Movement, Definition of fitness, Components of fitness, Benefits of fitness, Types of fitness and Fitness tips. ***PracticalComponents:Speed,Strength,Endurance,Flexibility,andAgility***	Total26 hrs2hrs/ week
	KHOKHO	**A.Fundamentalskills** 1. Skills in Chasing : Siton the box (Parallel &Bullettoe method),Getup from the box(Proximal & Distal foot method),GiveKho(Simple,Early,Late&Judgment),Pole Turn,Pole Dive,Tapping, Hammering, Rectification of foul. 2. Skills in running: Chain Play, Ring play and Chain & Ring mixed play. 3. Game practice with application of Rules and Regulations. **B. Rules and their interpretations and duties of the officials.**	
	KABADDI	**A.Fundamentalskills** 1. Skills in Raiding: Touching with hands, Use of leg-toe touch,squatlegthrust,sidekick,mulekick,arrowflykick, crossing of baulk line. Crossing of Bonus line. 2. Skills of holding the raider: Various formations, catching From particular position, different catches, catching formation and techniques. 3. Additional skills in raiding : Escaping from various holds, Techniques of escaping from chain formation, of fense and defense. 4. Game practice with application of Rules and Regulations. **B.Rules and their interpretations and duties of the of ficials**	

4thSem	**AthleticsTrack-**Sprints **Jumps-** LongJump **Throws-**ShotPut	**TrackEvents** Starting Techniques: Standing start and Crouch start(its variations)use of Starting Block. Acceleration with proper running techniques. Finishing technique: RunThrough, Forward Lunging and Shoulder Shrug. **Long Jump**: ApproachRun,Take-off,Flight in the air(HangStyle/HitchKick)andLanding **Shotput:**Holding the Shot,Placement, InitialStance,Glide, Delivery Stanceand Recovery(PerryO'BrienTechnique	Total26hrs
	AthleticsTrack- 110&400MtrsHurdles **Jumps-**HighJump **Throws-**DiscussThrow	**110Mtrsand 400Mtrs:** HurdlingTechnique:LeadlegTechnique,TraillegTechnique,SideHurdling,Over the Hurdles Crouch start(itsvariations)use of Starting Block. Approach to First Hurdles, InBetween Hurdles,LastHurdlestoFinishing. **Highjump**:ApproachRun,Take-off,BarClearance(Straddle)and Landing. **DiscusThrow**:Holding the Discus, InitialStancePrimarySwing,Turn, ReleaseandRecovery(Rotationinthecircle).	2hrs/week
	VOLLEYBALL	**A.Fundamentalskills** 1. Service:Underarmservice,Side armservice,Tennisservice,Floatingservice. 2. Pass:Underarmpass, Overhead pass. 3. SpikingandBlocking. 4. GamepracticewithapplicationofRulesandRegulations **B.Rulesandtheirinterpretationanddutiesofofficials.**	
	THROWBALL	A. **Fundamentalskills:** Overhandservice,Sidearmservice,twohandcatching,onehandoverheadreturn,sidearmreturn. B. **Rulesandtheirinterpretationsanddutiesof officials**	
	FOOTBALL	**A. FundamentalSkills** 1. Kicking: Kicking the ball with inside of the foot, Kicking theball with Full Instepofthefoot, Kickingtheball with InnerInstep ofthefoot,KickingtheballwithOuterInstep ofthefootandLoftedKick. 2. Trapping:Trapping- theRollingball,andtheBouncingballwith soleofthefoot. 3. Dribbling:Dribblingtheballwith Instepofthefoot, DribblingtheballwithInnerandOuterInstepofthefoot. 4. Heading:Instanding,runningandjumpingcondition. 5. Throw-in:Standingthrow-inandRunningthrow-in. 6. Feinting:Withthelowerlimbandupperpartofthebody. 7. Tackling:SimpleTackling,SlideTackling. 8. GoalKeeping:CollectionofBall,Ballclearance-kicking,throwinganddeflecting. 9. GamepracticewithapplicationofRulesandRegulations. **B. Rulesandtheirinterpretationanddutiesofofficials.**	

	BASKETBALL	**A. FundamentalSkills** 1. Passing:TwohandChestPass, TwohandsBounce Pass,OnehandBaseballPass,SidearmPass,Overhead Pass,HookPass. 2. Receiving:Twohandreceiving,Onehandreceiving, Receivinginstationaryposition,Receivingwhile JumpingandReceivingwhileRunning. 3. Dribbling:Howtostartdribble,dropdribble,High Dribble,LowDribble,ReverseDribble,Rolling Dribble. 4. Shooting:Lay-upshot anditsvariations,One hand Setshot,Two handsjumpshot,Hookshot,FreeThrow. 5. Rebounding:DefensivereboundandOffensiverebound. 6. IndividualDefence:Guardingtheplayerwiththeball andwithouttheball,Pivoting. 7. Gamepracticewith applicationofRulesandRegulations. **B. Rulesandtheirinterpretation and dutiesofofficials**	
	NETBALL	**A. Fundamentalskills** 1. Catching: onehanded,twohanded,with feetgroundedand inflight. 2. Throwing (Different passes and their uses): One hand passes (shoulder,highshoulder,underarm,bounce,lob), twohandpasses(Push,overheadandbounce). 3. Footwork:Landingononefoot,landingontwofeet,Pivot,Runningp ass. 4. Shooting:Onehand,forwardstepshot,andbackwardstepshot. 5. Techniquesof freedodgeandsprint,suddensprint, sprintandstop,sprintingwithchangeatspeed. 6. Defending:Markingtheplayer,markingtheball, blocking,insidethecircle,outsidethecircle. thecircleedgeagainstthepassing. 7. Intercepting:Passandshot. 8. Gamepracticewith applicationofRulesandRegulations. **B. Rulesandtheirinterpretation anddutiesofofficials**	

5thSem	**AthleticsTrack-** Relays **Jumps**-Triple Jump**Throws-** JavelinThrow	**RelayRace**:Starting,BatonHolding/Carrying,BatonExchangeinbetweenzone,andFinishing **TripleJump**:ApproachRun,Take-off,FlightintheHop,Step,JumpandLanding **Javelin Throw**: Grip, Carry, and Recovery (3/5 Impulse stride).Release	Total26hrs 2hrs/week
	Athletics Combined Events-Heptathlon & Decathlon **Jumps**- Pole Vault **Throws**-HammerThrow	CombinedEvents:Heptathlonallthe7events Decathlon:All10Events **PoleVault**:ApproachRun,PlantingthePole,Take-off,BarClearanceandLanding. **HammerThrow**:HoldingtheHammer,InitialStancePrimary Swing,Turn,ReleaseandRecovery(Rotationinthecircle).	
	HOCKEY	**A.FundamentalSkills** 1.Passing:Short pass,Longpass, pushpass, hit 2. Trapping. 3.DribblingandDozing. 4. Penaltystrokepractice. 5. Penaltycornerpractice. 6. Tackling:SimpleTackling,SlideTackling. 7. GoalKeeping,Ballclearance-kicking,anddeflecting. 8. GamepracticewithapplicationofRulesandRegulations. **B.Rulesandtheirinterpretationanddutiesofofficials.**	
	CRICKET	**A.FundamentalSkills** **1.**Batting-ForwardDefenseStroke,BackwardDefenseStroke, OffDrive,On Drive,Straight Drive,CoverDrive,SquareCut. **2.**Bowling-Out-swing,In-swing,OffBreak,LegBreakandGoogly. **3.**Fielding: Catching - The High Catch, The Skim Catch, The Close Catch andthrowingatthestumpsfromdifferent angles.LongBarrierandThrow,ShortThrow,Long Throw,ThrowingontheTurn. **4.**WicketKeeping **B.Rulesandtheirinterpretationanddutiesofofficials**	
	BASEBALL	**A. FundamentalSkills** PlayerStances– walking,extendingwalking,Lstance,catstanceGrip –standardgrip,chokegrip Batting – swing and bunt.Pitching Baseball:slider,fast pitch,curveball,dropball,riseball,changeup,knuckleball,screwball, **Rulesandtheirinterpretationand dutiesofofficials.**	

6thSem	**IndividualGames** **SHUTTLEBADMINTON**	**A. Fundamentalskills** 1. BasicKnowledge:VariouspartsoftheRacketandGrip. 2. Service:Shortservice,Long service,Long-highservice. 3. Shots:Overheadshot,Defensiveclearshot,Attacking clearshot,Dropshot,Netshot,Smash. 4. Gamepracticewith applicationofRulesandRegulations. **B. Rulesand theirinterpretationsanddutiesoftheofficials.**	Total26hrs 2hrs/week
	TABLETENNIS	**A. Fundamentalskills** 1. BasicKnowledge:VariouspartsoftheRacketandGrip (ShakeHand&PenHoldGrip). 2. Stance:Alternate&Parallel. 3. PushandService:Backhand &Forehand. 4. Chop:Backhand&Forehand. 5. Receive:PushandChopwithboth Backhand&Forehand. 6. Gamepracticewith applicationofRulesandRegulations. **Rulesand theirinterpretationsanddutiesofthe Officials**	
	HANDBALL	**A.FundamentalSkills** 1. Catching,ThrowingandBall control, 2. Goal Throws:Jumpshot,Centershot,Diveshot,Reverseshot. 3. Dribbling:Highandlow. 4. Attackandcounterattack,simplecounterattack,counter attackfromtwowingsandcenter. 5. Blocking,GoalKeepingandDefensiveskills. 6. Gamepracticewith applicationofRulesandRegulations. **B.Rulesandtheirinterpretation anddutiesofofficials**	
	BALLBADMINTON	**A. Fundamentalskills** 1. BasicKnowledge:VariouspartsoftheRacketandGrip. 2. Service:Shortservice,Long service,Long-highservice. 3. Shots:Overheadshot,Defensiveclearshot,Attacking clearshot,Dropshot,Netshot,Smash. 4. Gamepracticewith applicationofRulesandRegulations. **B.Rulesandtheirinterpretation anddutiesofofficials**	

Scheme of Assessment:

WEIGHTAGE	**100%**	**(100%)**
	CIE	CIE
At the End of 3rd Semester	**20**	**25**
At the End of 4th Semester	**20**	**25**
At the End of 5th Semester	**20**	**25**
At the End of 6th Semester	**20**	**25**
Written assignment/Quiz/Report writing/	**20**	**-**
TOTALMARKS FOR THECOURSE	**100**	**100**

Basaveshwar Engineering College, Bagalkote

B.E–4th Year Scheme of Teaching and Examinations

(2022-23Admitted Batch)

VII - Semester **Branch:Civil Engineering**

Sl. No.	Course			Teaching Department	Teaching hours and Scheme of Evaluation						
	Category	Code	Title		Lecture	Tutorial	Practica/ Drawing	CIE Marks	SEE Marks	Total Marks	Credits
					L	T	P				
1.	PCC	22UCV701C/ 22UCV801C	Design of Steel Structures	Civil Engineering	3	0	0	50	50	100	3
2.	PEC	22UCV7X2E/ 22UCV8X2E	Professional Elective Course - III	Civil Engineering	3	0	0	50	50	100	3
3.	PEC	22UCV7X3E/ 22UCV8X3E	ProfessionalElectiveCourse-IV	Civil Engineering	3	0	0	50	50	100	3
4.	Project	22UCV704P/ 22UCV804P	Project Work	Civil Engineering	-	-	-	50	50	100	12
5.	HSMC	22UHS753C	IntellectualPropertyRights	Humanities	3	0	0	50	50	100	3
6.	MC	22UHS001M/ 22UHS002M/ 22UHS003M/ 22UHS004M	NSS/Yoga/PE/Music	Humanities	-	-	-				0
					12	**0**	**0**	**250**	**250**	**500**	**24**

Professional Elective Course -III					Professional Elective Course -IV				
Code	Title	L	T	P	Code	Title	L	T	P
22UCV712E/ 22UCV812E	Advanced Design of RC Structures	3	0	0	22UCV713E/ 22UCV813E	Design of Pre-stressed Concrete Structures	3	0	0
22UCV722E/ 22UCV822E	Numerical Methods for Civil Engineering	3	0	0	22UCV723E/ 22UCV823E	Deep Foundations	3	0	0
22UCV742E/ 22UCV842E	Soil Dynamics and Earthquake Engineering	3	0	0	22UCV733E/ 22UCV833E	Solid Waste Management	3	0	0
22UCV752E/ 22UCV852E	Environmental Impact Assessment	3	0	0	22UCV743E/ 22UCV843E	Pavement Design	3	0	0
22UCV762E/ 22UCV862E	Design of Irrigation Structures	3	0	0	22UCV763E/ 22UCV863E	Matrix Methods of Structural Analysis	3	0	0

Basaveshwar Engineering College, Bagalkote

B.E–4th Year Scheme of Teaching and Examinations

(2022–23Admitted Batch)

VIII –Semester Branch:Civil Engineering

Sl. No.	Course			TeachingDepartment	Teaching hours and Scheme of Evaluation						
	Category	Code	Title		Lecture	Tutorial	Practical/ Drawing	CIE Marks	SEE Marks	Total Marks	Credits
					L	T	P				
1.	INT	22UCV705I/ 22UCV805I	Research/IndustrialInternship	NP	-	-	-	50	50	100	10
2.	AEC		MOOCs*	NP	3	0	0	50	50	100	3
3.	OEC		MOOCs*	NP	3	0	0	50	50	100	3
4	MC	22UHS001M/ 22UHS002M 22UHS003M 22UHS004M	NSS/Yoga/PE/Music	Humanities	-	-	-	-	-	-	0
					6	**0**	**0**	**250**	**250**	**500**	**16**