GOVERNMENT OF INDIA
MINISTRY OF
PARLIAMENTARY AFFAIRS

Azadi Ka Amrit Mahotsav

mygov मेरी सरकार

PREAMBLE TO THE CONSTITUTION

PREAMBLE

WE, THE PEOPLE OF INDIA,

having solemnly resolved to constitute India into a SOVEREIGN SOCIALIST SECULAR DEMOCRATIC **REPUBLIC** and to secure to all its citizens:

JUSTICE, social, economic and political;

LIBERTY of thought, expression, belief, faith and worship;

EQUALITY of status and of opportunity;

and to promote among them all

FRATERNITY assuring the dignity of the individual and the unity and integrity of the Nation;

IN OUR CONSTITUENT ASSEMBLY this 26th day of November, 1949, do HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.

I have read the Preamble

[redacted]

Signature

23-01-2022

SRI SIDDHARTHA ACADEMY OF HIGHER EDUCATION

("Deemed to be University u/s 3 of the UGC Act, 1956")

Accredited 'A+' Grade by NAAC

Agalakote, B.H.Road, Tumkur – 572 107.KARNATAKA, INDIA.

No. SSAHE/ACA-S&C/ 14 /UG(BE)/2024 Date: 15/07/2024

N O T I F I C A T I O N

Sub: - Ordinance pertaining to Curriculum of Undergraduate Programme Bachelor of Engineering (2nd Year Civil Engineering)

Ref: Proceedings of the Academic Council meeting held on 10/07/2024 vide agenda No. SSAHE/AC/XXVIII-12/2024

In exercise of the powers vested under section 6 of 6.05 of MoA / Rules of SSAHE, the Revised Ordinance pertaining to Curriculum of Undergraduate Programme Bachelor of Engineering (2nd Year Civil Engineering) is notified herewith as per Annexure.

By Order,

REGISTRAR

REGISTRAR
Sri Siddhartha Academy of Higher Education
TUMKUR - 572 107, Karnataka.

To,
Dean / Principal, Sri Siddhartha Institute of Technology,

Copy to
1) Office of the Chancellor, SSAHE, for kind information,
2) PA to Vice-Chancellor / PA to Registrar / Controller of Examinations / Finance Officer, SSAHE
3) All Officers of the Academy Examination Branch / Academic Section
4) Guard File / Office copy.

S.S.A.H.E TUMKUR

SRI SIDDHARTHA INSTITUTE OF TECHNOLOGY- TUMAKURU
(A constituent College of Siddhartha Academy of Higher Education, Tumakuru)
CHOICE BASED CREDIT SYSTEM (CBCS)
SCHEME OF TEACHING AND EXAMINATION FOR BE DEGREE COURSE

NEP Scheme

(Effective from the academic year 2022-23)

III SEMESTER B.E.

SI No.	Course Code		Course Title	Teaching dept.	L	T	P	C	CIE	SEE	Total Marks	Exam Hours
01	BS	22MA301	**Engineering Maths-3**	**MA**	4	-	-	**3**	50	50	100	3
02	PC	22CE302	**Applied Mechanics**	CE	4	-	-	**3**	50	50	100	3
03	PC	22CE303	**Engineering Geology**	CE	3	-	2	**4**	50	50	100	3
04	PC	22CE304	**Surveying**	CE	3	-	2	**4**	50	50	100	3
05	PC	22CE305	**Fluid Mechanics**	CE	3	-	-	**3**	50	50	100	3
06	PC	22CE306	**Dept. Skill Lab-1** *(BMT + HMT)*	CE	-	-	4	**2**	50	50	100	3
07	HS	22HS307	**Universal Human Values**	HS	2	-	-	**1**	50	-	50	-
08	HS	22EN308	**Environmental Studies**	HS	2	-	-	1	50	-	50	-
L: Lecture, T-Tutorial, P-Practical/Drawing, CIE: Continuous Internal Evaluation, SEE: Semester End Examination				**Total**	**21**	**-**	**8**	**21**	**400**	**300**	**700**	-
Credits Distribution: Basic Science (BS)=08+08+3=19, Electrical Science (ES)=10+11=21, Humanities & Social Sciences (HS)=1+2=03, Program Core (PC)=02+16=18, Total Credits=20+20+21=61												

Department: Mathematics			**Semester:**	**III**
Subject: Calculus of Variation and Numerical Techniques (Common to CV&ME)				
Subject Code:	**22MA301**		**L – T – P - C:**	**3–0–0–3**

Sl. No	Course Objectives
1	Understand the least square method to fit a curve for the given data and evaluate the correlation coefficient and regression lines for the data.
2	Introduce the Concept of Fourier series.
3	Study the concept of Numerical Methods and Calculus of Variations.
4	To learn the concept on Laplace transforms.

Unit	Description	Hrs
I	**Statistical Methods:** Definition of Correlation-Karl Pearson's coefficient of correlation–problems, Regression lines (All results without proof)–Problems. **Curve fitting:** Curve fitting by the method of least squares- Fitting of the straight line, second degree parabola and exponential form of the curve $y = ab^x$ (All results without proof) –Problems.	**08**
II	**Calculus of Variations:** Functional, Euler's Equation (Without derivations) standard variation problems, Minimal surface of revolution, Hanging chain problem, Brachistochrone problem.	**08**
III	**Numerical solution of ordinary differential equations of first order and first degree**: Taylor's series method, Modified Euler's method, Runge-Kutta method of fourth order, Milne's and Adams-Bashforth Predictor and Corrector methods (No derivation of formulae) -problems.	**08**
IV	**Laplace Transforms:** Basic definition, Laplace transforms of elementary functions, Properties of Laplace transforms, Laplace transforms of Periodic function, Unit step function (All results without proof)-Problems only. **Inverse Laplace transforms**: Basic definition, Evaluation of inverse Laplace transforms by standard methods. - Problems only. Applications: Solutions of second order linear differential equations using Laplace transforms method.	**08**
V	**Fourier Series:** Periodic function, Dirichlet's conditions. Fourier series of even and odd functions. Fourier series of periodic functions with period 2π and 2l-problems. Half range Fourier series, Practical harmonic analysis - problems	**08**

Course Outcomes:

Course outcome	Descriptions
CO1	Understand the concept of Laplace Transform, statistics, Fourier series and calculus of variations.
CO2	Use the concept of Laplace Transform, Fourier Series, Correlation, Regression lines and variational problems in Engineering field.
CO3	Apply Numerical Methods, Variational problems and Laplace transforms in Engineering fields.
CO4	Able to perform the simple linear regression and correlation for data samples in real life and Numerical methods in Engineering fields.

Course Articulation Matrix

CO \ PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2												
CO2	3	2	2											
CO3	3	3	3											
CO4	3	3	3									1		

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Higher Engineering Mathematics	B.S. Grewal	43rd Edition Khanna Publications, 2015.ISBN:9788174091956
2	Higher Engineering Mathematics	B.V. Ramana	1st Edition, Tata McGraw-Hill, 2006. ISBN:9780070634190

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Advanced Engineering Mathematics	E. Kreyszig	10th Edition JonWiley& Sons, 2015. ISBN:9780470913611
2	Higher Engineering Mathematics	H.K. Das Er. Rajnish Verma	1st Edition, Chand publishing, 2011. ISBN:9788121938907

SRI SIDDHARTHA INSTITUTE OF TECHNOLOGY- TUMAKURU

(A constituent College of Siddhartha Academy of Higher Education, Tumakuru)

NEP SCHEME -2022

Syllabus for the Academic year 2024 - 2025

Department: Civil Engineering		**Semester:**	**III**
Subject: Applied Mechanics			
Subject Code:	**22CE302**	**L – T – P - C:**	**4-0-0-3**

Course Objectives:

Sl. No.	This Course will enable the students to
1	Introduce the fundamental concepts of centroids, centers of gravity, emphasizing their importance in engineering.
2	Provide students with the skills to calculate moments of inertia of various geometrical shapes using integration methods.
3	Provide students with the ability to understand stress-strain concepts and assess compound stresses using Mohr's circle and analytical methods.
4	Provide students to develop problem-solving skills through the analysis of trusses and torsional systems

Unit	Description	Hrs.
I	**Centroid:** Definition of Centroid & Centre of Gravity, Location of Centroid of Rectangle, Triangle, Semicircle and Quadrant by method of integration. Simple Numerical problems.	8
II	**Moment of Inertia:** Concept of centre of gravity and centroid. Concept of Moment of inertia, perpendicular axis theorem, parallel axis theorem, and moment of inertia of Rectangular, Circular, Semi-circular, Quadrant of circle Triangular sections by method of integration. Numerical Problems on moment of inertia of composite section.	8
III	**Simple Stresses and Strain:** Introduction, Definition and concept of stress and strain. Hooke's law, Stress-Strain diagrams for ferrous and non-ferrous materials, factor of safety, Elongation of tapering bars of circular and rectangular cross sections, Elongation due to self-weight, Elastic constants and their relationship.	8
IV	C**ompound Stresses:** Introduction, state of stress at a point, General two dimensional stress system, Principal stresses and principal planes. Mohr's circle of stresses. **Analysis of Trusses:** Introduction, assumptions, analysis of pin jointed plane determinate trusses using method of joints and sections.	8
V	**Torsion in Circular Shaft:** Introduction, pure torsion, Assumptions, derivation of torsion equation for circular shafts, torsional rigidity and polar modulus Power transmitted by a shaft.	7

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	Identify and calculate the centroid of common geometrical shapes using analytical and integration methods.
CO2	Determine the moments of inertia for various sections using integration techniques.
CO3	Understand and apply stress-strain concepts and assess compound stresses using Mohr's circle and analytical methods.
CO4	Analyse trusses and torsional systems to enhance problem-solving skills.

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3		3								3		
CO2	3	3		3								3		
CO3	3	3		3								3		
CO4	3	3		3								3		

Text Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Elements of Civil Engineering and Engg. Mechanics	M.N SheshaPrakash, Ganesh B. Mogaveer	3rd edition, 2014
2	Strength of Materials	B.S. Basavarajaiah, P.Mahadevappa	University Press (India)Pvt.Ltd.,3rdEdition

Reference Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Elements of Civil Engineering and Engineering Mechanics	B.K Kolhapure	3rd edition, 2018
2	Engineering Mechanics	Stephen Timoshenko & DH Young,J.V.Rao	5th edition, 2017.
3	Elements of Strength of Materials	D.H.Young, S.P.Timoshenko	East West Press Pvt. Ltd., 5th Edition

Department: Civil Engineering **Semester: III**

Subject Name: ENGINEERING GEOLOGY

Subject Code: 22CE303 **L-T-P-C: 3-0-2-4**

Course objectives:

Sl no	Course objectives
1	Engineering geology is an applied discipline that involves the collection, analysis, and interpretation of geological data and information required for the safe development of civil works.
2	Students are able to understand the internal structure and composition of the earth and comprehend the properties, occurrence and uses of minerals and rocks in various industries and constructions of civil engineering structures.
3	This Course is to focus on the core activities of engineering geologists – site characterization and geologic mitigation. Through lectures, labs, student will learn the engineering properties of rock.
4	Also includes the assessment and mitigation of geologic hazards such earthquakes, landslides, flooding; the assessment of groundwater remediation and resource evaluation.

UNIT	Description	Hours
I	**Introduction**-scope and importance of geological studies in various civil engineering projects. Internal structure of the earth and its composition. **Mineralogy**: definition. Rock forming minerals and ore minerals, Physical properties of minerals, Special properties of minerals. **Lab Exercises:** Identification of minerals based on their physical properties : Silica group: Quartz and its varieties: Feldspar group: Orthoclase, Plagioclase; ; Carbonate group: Calcite, Dolamite. ; Pyroxene group: Talc; Mica group: Biotite. Muscovite; Amphibole group: Asbestos, Olivine, Hornblende, Corundum, Gypsum. Garnet, Ore minerals: Magnetite, Hematite,limonite,Pyrite, chalcopyrite, pyrolusite, Galena,Bauxite.Chromite.	6 Hrs

II	**Igneous petrology**- Definition of rock. Various forms of Igneous rocks, Texture and its types. Classification of Igneous rocks. **Lab Exercises:** Identification of Igneous rocks based on their physical characters: Granite, Diorite, Gabbro, Syenite, porphyries, Dolerite, Pegmatite, Basalt and its varieties. **Sedimentary petrology**: Mode of formation. Texture and its types, Structures, Gradation of Clastic rocks. Classification of sedimentary rocks and their characteristics. . **Lab Exercises**: detailed study and Identification and uses of Sedimentary rocks: Conglomerate, Breccia, Sandstone and its varieties, Laterite, Limestones, Shales. **Metamorphic petrology**- Agents and types of metamorphism, structures & textures in metamorphic rocks. **Lab Exercises:** Detailed study**,** Identification and engg uses of Metamorphic rocks; Gneiss, Schists and its varieties. Quartzite, Marble, slate, Phyllite, Charnockite.	7Hrs
III	**Structural and Engineering Geology:** Definition - Outcrops, Dip and Strike, Compass clinometers; Description of folds and its types; Faults and its types; Joints and its types; Recognition of folds, faults in the field and its consideration in Civil Engg projects; Geological site investigation, Surface and subsurface explorations by Geological and Geo-Physical investigations; Selection of site for Dams, Reservoirs, Tunnels, Bridge sites and Highways; Rock as a Engg material in construction of foundations, Concrete Aggregate, Road metal, Railway ballast with reference to Engg properties. **Lab Exercises**: Out crop problems,Dip and Strike problems, Borehole problems, Study of topographical features from Geological maps. Identification of symbols in maps.	7hrs
IV	**Geomorphology and Geodynamics** : Geological agents and their processes in restructuring the earth's surface, Weathering of rocks, Kinds of weathering, Formation of soil and its classification, Soil profile, Soil erosion and its conservation; Geological work of rivers; Concept of Plate tectonics, Geological hazards such as landslides and earthquakes, Causes, Effects.	7hrs
V	**Hydrogeology and Geoinformatics**: Hydrological cycle, Water bearing properties of Rocks and Soils, Aquifers and its types, Geological factors for selecting a site for sinking wells and Electrical Resistivity survey for Ground water explorations, Artificial Recharge of Groundwater by different methods, Effect of ground water on various Civil Engg structures. Study of Topographic maps and Contour maps; Remote Sensing – Concept, Application and its Limitations; Geographic Information System (GIS) and Global Positioning System (GPS).	8hrs

Sl No	Laboratory experiments to be conducted	hours
1	Identification of minerals based on their physical properties : Silica group: Quartz and its varieties:, Ore minerals: Magnetite, Hematite ,limonite, Pyrite, chalcopyrite, pyrolusite, Galena, Bauxite. Chromite.	17
2	Identification of minerals based on their physical properties : Feldspar group: Orthoclase, Plagioclase; ; Carbonate group: Calcite, Dolamite. ; Pyroxene group: Talc; Mica group: Biotite. Muscovite; Amphibole group: Asbestos, Olivine, Hornblende,	
3	Identification of Igneous rocks based on their physical characters: **Igneous Rocks:** Granite, Diorite, Gabbro, Syenite, porphyries, Dolerite, Pegmatite, Basalt and its varieties. **Sedimentary rocks:** Conglomerate, Breccia, Sandstone and its varieties, Laterite, Limestones, Shales. **Metamorphic rocks**; Gneiss, Schist and its varieties. Quartzite, Marble, slate, Phyllite. Charnockite.	
4	**Structural geology problems:** Out crop problems, Dip and Strike problems, Borehole problems	
5	Study of topographical features from Geological maps. Identification of symbols in maps.	

Course Outcomes

Course outcome	Descriptions
CO1	After successful completion this course students will be able to: Describe index properties of earth dynamic and justify geological hazards.
CO2	Determine minerals and rock mass properties and its suitability in engineering projects
CO3	Estimate and evaluate the ground behavior and conditions of rocks
CO4	Delineate the interactions between groundwater systems and change detection of thematic layers through geo-informatics techniques.

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1		2	1	3	1	3	3	2	2	2	2		
CO2	2	1	2	1	3	2	2	3	1	2	2	2		
CO3	3	2	2	1	3	2	3	3	2	3	2	2		
CO4	2	2	3	1	3	1	2	3	2	2	2	2		

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Text book of Engineering and General Geology	Parbin Singh	Katson publishing house, Ludhiana, 2009.2nd Edition.
2	Text book of Geology	Mukherjee, P. K	World Press Pvt. Ltd., Kolkatta

Reference Book:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Principles of Petrology	Tyrrell, G. W	Chapman & Hall Ltd, 1978.
2	Groundwater Hydrology	Todd, D. K	John Wiley & Sons, New York, 1980.

Department: Civil Engineering		**Semester:**	**3rd**
Subject: Surveying (Integrated Course)			
Subject Code:	**22CE304**	**L – T – P - C:**	**3-0-2-4**

Course Objectives:

Sl. No.	This Course will enable the students to
1	understand the fundamentals of chain and compass surveying and the usage of basic surveying Instruments.
2	gain knowledge about leveling in surveying and use the various leveling instruments to compute the reduced level of a point on the ground.
3	know the usage of plane table in developing maps and to compute the capacity of reservoirs by contouring.
4	gain the knowledge of the curve setting by various methods and modern surveying equipments.

Unit	Description	Hrs.
I	**Introduction to chain Surveying**: Types of Chains and Tapes, Ranging of lines and its types, Measurement of distances over sloping ground. Errors and Corrections in Tape Measurements. Problems on above. **Introduction to Compass Surveying**: Principle and working of prismatic compass. Whole Circle Bearing and Reduced Bearing, calculation of bearings and included angles in a closed traverse.	8
II	**Levelling**: Principles and basic definitions of levelling, parts of Dumpy level, Temporary adjustments, Methods of Levelling- simple, differential, fly, fly- back, profile and cross sectioning. Booking of levels- height of instrument method and rise and fall method. Arithmetic checks. Numerical problems on above.	7
III	**Curve Setting**: Simple Curves. Elements. Designation of curves. Methods of setting simple curves by linear methods and Rankine's deflection angle method. Problems. Compound Curves: Elements. Design of compound curves. Setting out of compound curves. Simple Numerical Problems.	8
IV	**Plane table survey**: Introduction, accessories, advantages and limitations, Orientations and methods of orientation. Methodology of plotting-radiation, Intersection. Errors in plane table survey. **Contouring**: Contours, Methods of contouring, Interpolation of contours, contour gradient, characteristics of contours and uses.	8
V	**Areas and Volumes:** Measurement of area by dividing the area into geometrical figures, area from offsets, mid ordinate rule, trapezoidal and Simpson's one third rule, area from co-ordinates. Measurement of volumes- trapezoidal and prismoidal formula. Total station and its accessories, fundamental measurements, types of total station instruments, advantages and disadvantages	8

	Laboratory Experiments to be conducted: (1) Construction of Polygons by chain and Compass (Pentagon and hexagon) (2) Determination of reduced levels of points using dumpy level/auto level by simple Levelling, differential levelling and Fly levelling. (3) Determination of depth of cut and depth of fill for a given formation level by Profile levelling and Cross Section Levelling (4) To locate points using radiation and intersection method of plane tabling. (5) Introduction to the total station and to study the parts of Total station and Basic operation.	13

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	use basic surveying instruments in obtaining the field Measurements.
CO2	measure the elevation of ground by different Levelling instruments and leveling techniques.
CO3	Set out simple curves by various methods and calculate the areas and volumes by various methods.
CO4	Gain knowledge on plane tabling instruments and contours and modern surveying equipments.

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2		2	3	2		1	2			1
CO2	3	2	1	2	2	2		2	2	1		2
CO3	2	2		1	1	3		2	3	1		1
CO4	1	1	1	1	3	2			3			2

Text Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	"Surveying", Laxmi Publications, NewDelhi	B C Punmia, Ashok kumar Jain and Arunkumar Jain	Volume 1, 16th Edition, 2016
2	"Surveying", Laxmi Publications, NewDelhi	B C Punmia, Ashok kumar Jain and Arunkumar Jain	Volume 2, 17th Edition, 2016

Reference Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	"Surveying and levelling", Standard Book House, New Delhi	K R Arora	Volume 1, 11th Edition,2015
2	"Engineering Surveying", Tata McGraw Hill publications, New Delhi	S K Duggal	Volume 1,3rd Edition, 2009

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NEP SCHEME -2022

Syllabus for the Academic year 2024 - 2025

Department: Civil Engineering		**Semester:**	**3rd**
Subject: Fluid Mechanics			
Subject Code:	**22CE305**	**L – T – P - C:**	**3-0-0-3**

Course Objectives:

Sl. No.	This Course will enable the students to
1	Gain the knowledge on concepts of fluid mechanics useful in civil engineering applications.
2	Get exposure on fluid statics and kinematics.
3	Gain knowledge on dynamics and measurement of pressure.
4	Get Exposure to computations of flow measurements.

Unit	Description	Hrs.
I	PROPERTIES OF FLUIDS: Definition of Fluid, Distinction between solids & fluids, fluid continuum. Mass density, specific volume, Specific Weight, Relative density or Specific Gravity Viscosity, Newton's law of viscosity, Newtonian and Non-Newtonian Fluids, Ideal and Real fluids, Surface tension, Capillarity, surface tension-hollow and solid bubble and Problems.	8
II	FLUID PRESSURE AND ITS MEASUREMENT: Definition of pressure, Pascal's law, Hydrostatic pressure law, Absolute and Gauge pressure, Simple and Differential Manometer theory (No Problems) HYDROSTATICS: Definition of total pressure and center of pressure. Derivation of center of pressure, Equation for hydrostatic force, Problems on hydrostatic force on vertically and Inclined submerged surfaces.	8
III	KINEMATICS OF FLUIDS: Derivation of continuity equation in three dimensions in differential form, Definition of velocity potential, stream functions, stream line, equipotential line, Relation between velocity potential and stream function, Laplace equation. Problems on stream function and velocity potential	8
IV	DYNAMICS OF FLUID FLOW: Derivation of Euler's equation and Bernoulli's equation (2 dimensional) with assumption and limitation, Modification of Bernoulli's equation, Problems and Discharge equation for Venturi meter and Problems. FLOW THROUGH PIPES: Flow through pipes, Major loss equation for head loss due to friction (Darcy- Weishbach equation), Minor losses equation for head loss due to sudden expansion and contraction.	8
V	FLOW MEASUREMENTS: Flow through Orifices - classification, Hydraulic co-efficients of an Orifice and relation between them, Equation for co-efficient of velocity. Flow over notches, classification, Equation for discharge over rectangular and V- notches (Velocity of approach and end contractions not included) Types of Nappe, Ventilation of weirs, Broad crested weirs, Problems on weirs and notches	8

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	The student will be able to possess knowledge of fundamental properties of fluids and their problems
CO2	The student will be able to compute and solve problems on fluid pressure and hydrostatics
CO3	be able to compute and solve problems on fluid kinematics and fluid dynamics
CO4	be able to compute discharge through pipes and over notches and weirs

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	2	3	2					3	2
CO2	3	3	1	2	3	2					3	2
CO3	3	3	1	2	3	2					3	2
CO4	3	3	1	2	3	2					3	2

Text Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Hydraulics and Fluid Mechanics Including Hydraulic Machines	P.N. Modi and S.M. Seth	20th Edition- 2015
2	A textbook of Fluid Mechanics and Hydraulic Machines	R K Bansal	9th Edition -2017

Reference Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Elementary Hydraulics	Cruise, J.F., Singh, V.P. and Sherif,M.M.	1st Edition -2007
2	Fluid Mechanics and Hydraulic Machines	R K Rajput	6th Edition -2009

SRI SIDDHARTHA INSTITUTE OF TECHNOLOGY- TUMAKURU

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NEP SCHEME -2022

Syllabus for the Academic year 2024 - 2025

Department: Civil Engineering		**Semester:**	**III**
Subject: DEPARTMENT SKILL LAB-1 (BMT+HMT)			
Subject Code:	**22CE306**	**L – T – P - C:**	**0 – 0 – 4 - 2**

Course Objectives:

Sl. No.	This Course will enable the students to
1	Ability to apply knowledge of mathematics and engineering in calculating the mechanical properties of structural materials.
2	To enable the students to understand the quality of highway material and learn the procedure of testing bituminous materials as per the standard code recommendations.
3	Understanding of professional and ethical responsibility in the areas of material testing.
4	Ability to function on multi-disciplinary teams in the area of materials testing

UNIT	Description
	PART-A
1	Mechanical characterization of mild steel materials by conducting Tension, Compression, Shear and Torsion test.
2	Impact test on Mild Steel (Charpy & lzod)
3	Bending Test on RCC beam for pure bending
	PART-B
4	Test on Fine and Coarse Aggregates: a. Specific Gravity b. Water Absorption
5	Aggregate Impact Value, Crushing Strength test and Shape test.
6	Specific gravity, Penetration test, Flash and fire point test of bitumen.
7	Softening point test , Ductility test and Viscosity test of bitumen.

Course Outcomes

Course outcome	Descriptions
CO1	Students will be able to understand the behavior of engineering materials by conducting Tension, Compression, Shear and Torsion tests
CO2	Students will be able to understand the behavior of engineering materials by conducting Impact and Bending tests
CO3	Students will be able to find properties coarse and fine aggregates
CO4	Students will be able to understand the testing of bituminous materials as per the standard code recommendations

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	2	1	2	2	1	-	2	1	-	1	3	1
CO2	3	2	2	2	1	1	2	1	2	1	-	1	3	2
CO3	3	2	2	2	1	1	2	1	2	1	-	1	3	2
CO4	3	1	2	1	2	2	1	-	2	1	-	1	3	1

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Testing of Engineering Materials	Davis, H.E., Troxell, G. and Hauck, G.	McGraw Hill Publications, New York. 1984
2	Highway Engineering	Khanna& Justo and A.Veeraraghvan	Khanna publications, Volume 10 (2018)

Reference Book:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Mechanical Testing of Materials	Fenner,	George Newnes Ltd. London
2	Experimental Strength of Materials	Holes K A,	English Universities Press Ltd. London
3	Highway materials testing lab manual	Khanna, Justo and A.Veeraraghavan	Nem Chand & Bros publication, 2013
4	MoRTH 5th revision and Relevant IS, IRC codes.		

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NEP SCHEME -2022

Syllabus for the Academic year 2024 - 2025

Department: CIVIL ENGINEERING **Semester: III**

Subject Name: UNIVERSAL HUMAN VALUES

(HUMANITY SCIENCE Course)

Subject Code: 22HS307 **L-T-P-C: 1-0-0-1**

Sl. No	Course Objectives
1	This introductory course input is intended: To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings
2	To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.
3	To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature.
4	This course is intended to provide a much needed orientation input in value education to the young enquiring minds.

Unit	Description	Hrs
I	**Introduction to Value Education:** -Understanding Value education-Need, Guidelines, content, Role of education-Sanskar -Process for Value Education- Self-exploration, the Dialogue Within. -Continuous Happiness and Prosperity – the Basic Human Aspirations. -Right Understanding, Relationship and Physical Facility. -Exploring the Meaning of Happiness and Prosperity. -Method to Fulfill the Basic Human Aspirations	6 hrs
II	**Harmony in the Human Being:**-Understanding the Human being (As the Co-existence of the Self and Body) -Distinguishing between the Needs of the Self and the Body -The Body as an Instrument of the Self-The response of the self and the body -Understanding Harmony in the Self-State of imagination -Understanding Harmony of the Self with the Body -Programme to ensure self-regulation and Health-Nurturing the body	6 hrs

III	**Understanding Harmony in the Family and Society** Harmony in the Family – the Basic Unit of Human Interaction Values in Human-to-Human Relationship "Trust' – the Foundational Value in Relationship 'Respect' – as the Right Evaluation.- Other Naturally Acceptable Feelings in Relationship-Affection, Care, Guidance, Reverence, Glory, Gratitude and Love Vision for the Universal Human Order-from family to world family.	6 hrs
IV	**Understanding Harmony in the Nature/Existence:** -Understanding Harmony in the Nature -Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature -Realizing Existence as Co-existence at All Levels- The Holistic Perception of Harmony in Existence	4 hrs
V	**Implications of the Holistic Understanding – a Look at Professional Ethics** Natural Acceptance of Human Values -Definitiveness of (Ethical) Human Conduct -A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order -Competence in Professional Ethics -Holistic Technologies, Production Systems and Management Models- Typical Case Studies -Strategies for Transition	6 hrs

Course Outcome:

COs	Descriptions
CO1	By the end of the course, students are expected to become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
CO2	They would have better critical ability, also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
CO3	It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.
CO4	This is only an introductory foundational input. It would be desirable to follow it up by a) Faculty-student or mentor-mentee programs throughout their time with the institution b) Higher level courses on human values in every aspect of living

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1				1		3	3	3	2	3				
CO2				2		3	3	3	2	3				
CO3				2		3	3	3	2	3				
CO4				2		3	3	3	2	3				

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	A Foundation Course in Human Values and Professional Ethics,	R R Gaur, R Sangal G P Bagaria,	Excel Books, New Delhi,2010
2	The Teacher's Manual Teachers' Manual for A Foundation Course in Human Values and, Professional Ethics,	R R Gaur, R Asthana, G P Bagaria	2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	. Jeevan Vidya: EkParichaya,.	A Nagaraj,	Jeevan Vidya Prakashan, Amarkantak, 1999.
2	Human Values,	A.N. Tripathi,	New Age Intl. Publishers, New Delhi, 2004
3	The Story of Stuff (Book). . i) Small is Beautiful ii) Slow is Beautiful	 - E. F Schumacher. - Cecile Andrews	
4	The Story of My Experiments with Truth	- by Mohandas Karamchand Gandhi	

Department: CIVIL ENGINEERING **Semester: III**

Subject Name: ENVIRONMENTAL STUDIES (HUMANITY SCIENCE Course)

Subject Code: 22EN308 **L-T-P-C: 1-0-0-1**

Sl. No	Course Objectives
1	To identify the major challenges in environmental issues and evaluate possible solutions. To analyze an overall impact of specific issues and develop environmental management plan.
2	Develop analytical skills, critical thinking and demonstrate socio-economic skills for sustainable development.
3	To gain knowledge on different types of pollution in the environment.
4	To analyze an overall impact of specific issues and develop environmental management plan environment.

Unit	Description	Hrs
I	Introduction: Environment - Components of Environment Ecosystem: Types of Ecosystem, Balanced ecosystem. Human Activities – Food, Shelter, And Economic & Social Security, Effects of human activities on environment-Agriculture, Housing, Industry, Mining & Transportation. Environmental Impact Assessment (EIA), Sustainable Development.	6 hrs
II	Natural Resources-Introduction, types of resources, Water resources – Availability & Quality aspects, Water borne diseases & water induced diseases, Fluoride problem in drinking water. Mineral resources, Forest Wealth. Material Cycles – Carbon Cycle, Nitrogen Cycle & Sulphur Cycle.	6 hrs
III	Definition, Effects – Global Warming, Acid rain & Ozone layer depletion, controlling measures. Solid Waste Management, E - Waste Management & Biomedical Waste Management -Sources, Characteristics & Disposal methods. Environmental Acts & Regulations, Role of government, Legal aspects, Role of Non-governmental Organizations (NGOs) , Environmental Education	6 hrs
IV	Environmental Pollution – Air Pollution & Automobile Pollution Water Pollution, Noise pollution, Land Pollution, Public Health Aspects. Global Environmental Issues: Population Growth, Urbanization, Land Management, Water & Waste Water Management.	4 hrs

V	Energy – Different types of energy, Conventional sources & Non-conventional sources of energy Solar energy, Hydro electric energy, Wind Energy, Nuclear energy, Biomass & Biogas Fossil Fuels, Hydrogen as an alternative energy.	6 hrs

Course Outcome:

COs	Descriptions
CO1	Understand the principles of ecology and environmental issues that apply to air,land, and water issues on a global scale,
CO2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment,
CO3	Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components
CO4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2				3	2	2	1	1	2	3		
CO2	3	2				3	2	2	1	1	1	1		
CO3	3	3				3	2	1	1	1	3	1		
CO4	2	3				2	2	1	1	1	2	1		

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Environmental Studies	Benny Joseph	Tata McGraw– Hill Publishing Company Limited(2005), Delhi.
2	Environmental Studies	R Rajagopalan	From Crisis to Cure", Oxford University Press, 2005,

Reference Books:

Sl No	Reference book title	Author	Volume and Year of Edition
1	Environmental Science and Engineering	Aloka Debi,	Universities Press (India) Pvt. Ltd. 2012
2	Environmental Studies	R.J.Ranjit Daniels	Wiley India Private Ltd., New
3	Text Book of Environmental and Ecology",	Dr.Pratiba Sing, Dr.AnoopSingh and Dr.Piyush Malaviya,	Acme Learning Pvt. Ltd. New Delhi
4	Environmental Science – working with the Earth	G.Tyler Miller Jr.,	Eleventh Edition, Thomson Brooks /Cole, 2006

SRI SIDDHARTHA INSTITUTE OF TECHNOLOGY- TUMAKURU
(A constituent College of Siddhartha Academy of Higher Education, Tumakuru)
CHOICE BASED CREDIT SYSTEM (CBCS)
SCHEME OF TEACHING AND EXAMINATION FOR BE DEGREE COURSE

NEP Scheme

(Effective from the academic year 2022-23)

IV SEMESTER B.E.

SI No.	Course Code		Course Title	Teaching dept.	L	T	P	C	CIE	SEE	Total Marks	Exam Hours
01	BS	22MA401	**Engineering Maths-4**	**MA**	4	-	-	**3**	50	50	100	3
02	PC	22CE402	**Strength of Materials**	CE	4	-	-	**3**	50	50	100	3
03	PC	22CE403	**Environmental Engineering**	CE	3	-	2	**4**	50	50	100	3
04	PC	22CE404	**Building Planning And Drawing**	CE	3	-	2	**4**	50	50	100	3
05	PC	22CE405	**Hydraulics and Hydraulic Machines**	CE	4	-	-	**3**	50	50	100	3
06	PC	22CE406	**Dept. Skill Lab-2 (F M + Survey)**	CE	-	-	4	**2**	50	50	100	3
07	HS	22SK407	**Skill Development-1 (T&P)**	**HS**	2	-	-	**1**	50	-	50	-
08	HS	22CI408	**Constitution of India**	HS	2	-	-	1	50	-	50	-
L: Lecture, T-Tutorial, P-Practical/Drawing, CIE: Continuous Internal Evaluation, SEE: Semester End Examination				**Total**	**19**	**-**	**8**	**21**	**400**	**350**	**750**	18
Credits Distribution: Basic Science (BS)=08+08+3+3=22, Electrical Science (ES)=10+11=21, Humanities & Social Sciences (HS)=1+2+2=5, Program Core (PC)=02+16+16=34, Total Credits=20+20+21+21=82.												

Department: Mathematics			**Semester:**	**IV**
Subject: Probability and Complex Analysis (Common to CV & ME)				
Subject Code:	**22MA401**		**L – T – P - C:**	**3-0-0-3**

Sl. No	Course Objectives
1	Understand the concept of Probability Distribution, Joint of Probability Distribution and Complex Analysis.
2	Solve the system of equations by Cremer's rule and LU- Factorization method**.**
3	Demonstrate Stochastic problem as Markov model and solve the problem.
4	Illustrate the applications of Probability and statistics in Engineering field.

Unit	Description	Hrs
I	**Probability Distributions:** Review of basic probability theory**.** Random variables (Discrete and Continuous), Probability of mass/density functions. Binomial distribution, Poisson's distribution, exponential distribution and Normal distribution (without derivations) and problems.	**08**
II	**Linear Algebra:** Solution of System of Equations by Cramer's rule and LU-Factorization method**.** Recapitulation of Eigen values and Eigen vectors of a real matrix. Properties of Eigen values and Eigen vectors, problems on Cayley - Hamilton Theorem. Diagonalization of matrices by Orthogonal Transformation, Reduction of a quadratic form to Canonical form, Nature of quadratic forms, problems.	**08**
III	**Numerical Integration:** Simpson's $1/3^{rd}$ rule, Simpson's $3/8^{th}$ rule and Weddle's rule (without proof)- problems. **Joint probability distribution:** Joint probability distribution for two discrete random variables, Marginal distributions, Expectation, Co-variance - problems.	**07**
IV	**Markov Chain:** Probability Vector, Stochastic Matrix, Regular Stochastic Matrix, definition of Markov Chain, Transition Probabilities and Transition probability Matrix, Higher Transition Probabilities, state transition diagram, stationary distribution of regular Markov chains, problems	**09**
V	**Complex Analysis:** Review of function of a complex variables, limits, continuity, and differentiability. Analytic functions, Cauchy-Riemann equations in Cartesian and polar forms (without proof). Construction of analytic functions by Milne-Thompson Method-problems. Bilinear Transformations.	**08**

Course Outcomes:

Course outcome	Descriptions
CO1	Understand the concept of Probability Distribution, Eigen values and Eigen vectors of a matrix, Markov Chain and Complex Analysis.
CO2	Apply Numerical Integration, Markov chain, Linear Algebra and Complex Analysis in Engineering fields.
CO3	Make use of Probability Distribution, Eigen values and Complex Analysis to solve various Engineering problems.
CO4	Analyze and apply the concept of Eigen value problems, Markov chain and Joint of Probability Distribution in Engineering field.

Course Articulation Matrix

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2												
CO2	3	2	2									1		
CO3	3	3	3											
CO4	3	3	3											

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Higher Engineering Mathematics	B.S.Grewal	43rd Edition Khanna Publications, 2015. ISBN:9788174091956
2	An Introduction to Probability Theory and its Applications	W. Feller	3rdEdition,JohnWiley&Sons,Inc,2008, ISBN9788126518050

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	A First Course in Probability	S. Ross	8thEdition,Pearson,2010,ISBN:9780136033134
2	Higher Engineering Mathematics	B.V.Ramana	1st Edition, Tata McGraw-Hill, 2006. ISBN:9780070634190

Department: Civil Engineering		**Semester:**	**IV**
Subject: Strength of Materials			
Subject Code:	**22CE402**	**L – T – P - C:**	**4-0-0-3**

Course Objectives:

Sl. No	This course will enable the students to
1	Understand the concept of bending moments and shear forces in different types of beams under various loading conditions.
2	Evaluate the bending stress and shear stress in beams with different cross sections.
3	Understand the behaviour of short and long columns under different support conditions.
4	Analyse slope and deflection in beams.

Unit	Description	Hrs
I	S**hear 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 shearforce. Shearforce and bending moment diagrams for statically determinate beams subjected to point load, uniformly distributed loads, uniformly varying loads, couple and their combinations.	9
II	**Bending in beams:** Introduction, pure bending theory, Assumptions, derivation of bending equation, modulus of rupture, section modulus and flexural rigidity.	7
III	**Shear Stresses in Beams:** Expression for transverse shear stress in beams, shear stress distribution diagrams and problems on circular, rectangular, I and T sections	7
IV	**Columns and Struts:** Introduction, short and long columns. Euler's theory; Assumptions, Derivation for Euler's Buckling load for different end conditions, Limitations of Euler's theory. Rankine-Gordon's formula for columns.	8
V	**Slope and Deflection in Beams:** Introduction, differential equation of the deflection curve, Double integration method, Macaulay's method.	8

Course Outcomes:

Course outcome	At the end of the course students will be able to
CO1	Calculate the bending moments, shear force and draw BMD, SFD for various types of beams and loadings.
CO2	Analyse the bending stress and shear stress in beams with different cross sections.
CO3	Determine the buckling of the columns.
CO4	Evaluate the slope and deflection in beams.

Course Articulation Matrix

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2		2								3	3	2
CO2	3	2		2								3	3	2
CO3	3	2		2								3	3	2
CO4	3	2		2								3	3	2

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Strength of Materials	B.S.Basavarajaiah, P.Mahadevappa	University Press (India)Pvt.Ltd.,3rdEdition
2	Strength of Materials	S S Bhavikatti,	Vikas Publishing (5th Edition)

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Elements of Strength of Materials	D.H.Young, S.P.Timoshenko	East West Press Pvt. Ltd., 5th Edition
2	Mechanics of Materials	M.N SheshaPrakash, Ganesh B. Mogaveer	PHI publishing house Pvt Ltd.

Department: Civil Engineering		**Semester:**	**4**
Subject: ENVIRONMENTAL ENGINEERING			
Subject Code:	**22CE403**	**L – T – P - C:**	**3-0-2-4**

Course Objectives:

Sl. No.	This Course will enable the students to
1	Know about various water demands in a city and estimation of water supply to a city/ town
2	Know about the sources, collection and characteristics of water
3	Know about the unit process and its design in WTP & treatment of wastewater
4	Know about environmental pollution and Water quality analysis of different parameters in laboratory

Unit	**Description**	**Hrs.**
I	Introduction: Sources of water pollution, Need for protected water supply, Demands of water-Types of water demands- domestic demand, institutional and commercial, public uses, fire demand estimation by different methods, Per capita consumption –factors affecting per capita demand, population forecasting methods and numerical problems, variations in demand of water	**8**
II	**Sources:** surface and ground water source – suitability, Occurrence, zones and movement of ground water, bore wells and its recharge, hydrological cycle, Characteristics of water-sampling, water quality standard as per BIS, intake structures – river intake; factors for selection and location of intakes. pumps- necessity & types, factors governing selection of source of water	**8**
III	**Water Treatment:** Objectives – Treatment flow-chart, significance of each unit **Aeration** & its objective, **Sedimentation:** Theory, settling tanks-design. Coagulation & Flocculation, Coagulation aided with sedimentation, Types of coagulant, jar test **Filtration**: theory of filtration, types of filters- slow sand, rapid sand-design, Operational problems in filter, trouble shooting	**8**
IV	**Disinfection**: Theory of disinfection, types of disinfection, Chlorination, Estimation of chlorine demand, residual chlorine, percentage of chlorine in bleaching powder. **Technical visit to WTP** **Treatment of wastewater:** flow diagram of municipal wastewater treatment (STP) and its significance ,Characteristic of municipal wastewater, Activated sludge process, BOD-Significance and numericals	**7**
V	**Environmental pollution:** Air pollution-classification of pollutants, sources of emission, photochemical smog, Meteorological factors, effect on human health, plants & materials, Bhopal gas tragedy, Noise pollution-sources, effect & control Water resources of Karnataka: Dams, main rivers and its tributaries Environmental Acts: Water act, Air Act, Environmental protection act (only objectives)	**8**

Sl No	Laboratory experiments to be conducted	hours
1	Determination of Total Hardness in a GW sample	**13**
2	Determination of optimum dosage of coagulant	
3	Determination of p^H, TDS & fluoride in a given sample	
4	Determination of Solids in a wastewater	
5	Determination of DO, BOD and COD	

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	Estimate average and peak water demand for a community.
CO2	Evaluate available sources of water, quantitatively and qualitatively and make appropriate choice for a community
CO3	Know unit process and operations in water and wastewater treatment and its design
CO4	Know the concepts of environmental pollution and laboratory analysis of various parameters

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2				3	2	2	1	1	2	3		
CO2	3	2				3	2	2	1	1	1	1		
CO3	3	3				3	2	1	1	1	3	1		
CO4	2	3				2	2	1	1	1	2	1		

Text Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Environmental Engineering	Howard S. Peavy, Donald R. Rowe, George T	McGraw Hill International Edition. New York,2000
2	Water supply Engineering	S. K. Garg	Environmental Engineering vol-I M/s Khanna Publishers, New Delhi2010

Reference Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Environmental Engineering I-Water Supply Engineering	B.C. Punmia and Ashok Jain	Laxmi Publications (P) Ltd., New Delhi2010
2	Text book of Air Pollution and Control Technologies	Anjaneyulu Y	Allied Publishers,2002

Department: Civil Engineering		**Semester:**	**IV**
Subject: Building Planning and Drawing (CAD lab)			
Subject Code:	**22CE404**	**L – T – P - C:**	**3-0-2-4**

Course Objectives:

Sl. No.	This Course will enable the students to
1	Achieve skill sets to prepare computer aided engineering drawings
2	Understand the details of construction of different building elements.
3	Visualize the completed form of the building and the intricacies of construction based on the engineering drawings.
4	To provide the concepts of layout plan of Rainwater recharging and harvesting system

Unit	Description	Hrs.
I	Building Drawings: 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 National Building Code. **Introduction to AutoCAD Tool** Drawing of Plan, elevation and sectional elevation using CAD software for: a. Single storey residential building b. Double storey residential building c. School building d. Office building • ***Students should sketch to dimension the above in a drawing sheet before doing the computer drawing.*** • ***Single line diagrams to be given in the examination***	8
II	**Drawings Related to Different Structures:** a. Different types of staircases – Dog legged, Open - Newel staircase b. C/S of highway c. Layout plan of Rainwater recharging and harvesting system ***Note: Students should sketch to dimension the above in a Drawing sheet.***	8

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	Gain foundational knowledge of building planning and design concepts
CO2	Demonstrate proficiency in reading and interpreting professional drawings within a professional setting
CO3	Apply procedural knowledge in the submission of drawings and develop working drawings for various structures
CO4	Analyze given requirements to plan and design residential or public buildings effectively

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3		3		3			3		3		3		
CO2	3		3		3			3		3		3		
CO3	3		3		3			3		3		3		
CO4	3		3		3			3		3		3		

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Building drawing with an integrated approach to Built Environment Drawing	MG Shah, CM Kale, SY Patki	4th Edition 2017, Tata Mc Graw Hill Publishing co. Ltd., New Delhi
2	Building Construction and Material	Gurucharan Singh	17th Edition 2019, Standard Publishers, & distributors, New Delhi.

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Computer Aided Design Laboratory,	M N Sheshaprakash, Dr. G S Suresh	1st Edition 2006, Laxmi Publication, New Delhi
2	Building Planning and Drawing,	S S Bhavikatti M V Chitawadgi	1st Edition 2019, I K International Publishing House, New Delhi
3	IS: 962-1989 (Code of practice for architectural and building drawing)		
4	National Building Code, BIS, New Delhi.		

Department: Civil Engineering		**Semester:**	**4th**
Subject: Hydraulics and Hydraulic Machines			
Subject Code:	**22CE405**	**L – T – P - C:**	**3-0-0-3**

Course Objectives:

Sl. No.	This Course will enable the students to
1	To introduce the students to the principles of fluid flow problems associated with pipe flows, open channel flows and to solve practical fluid flow problems.
2	To provide an exposure to the principles of dimensional analysis
3	To provides an exposure to the impact of jet on different types of vanes
4	To provides an exposure to the working principles and performance characteristics of hydraulic machines.

Unit	Description	Hrs.
I	**Flow In Open Channels:** Definition of Open Channels, Classification, Difference Between Pipe Flow & Open Channel Flow, Types of Flow, Geometric Properties of Open Channels, Uniform Flow in Open Channels, Chezy's and Manning's Formulae and Problems on Uniform Flow. Specific Energy- Definitions, Specific Energy Curve, Conditions for Minimum Specific Energy and Maximum Discharge. Critical Flow in Rectangular Channels and Problems.	10
II	**Dimensional Analysis & Model Similitude:** Introduction to Dimensional Analysis - Units & Dimensions, Table of Dimensions, Dimensional Homogeneity, Methods of Analysis (Rayleigh's & Buckingham's Method), Problems on Rayleigh's & Buckingham's Methods. Model Studies - Introduction, Comparison with Dimensional Analysis, Similitude and Dimensionless Parameters.	07
III	**Impact Of Jet on Flat and Curved Vanes:** Introduction to Impulse Momentum Equation and Its Applications. Force Exerted by a Jet on a Fixed vane - Derivations. Force Exerted by a Jet on Moving Target- Derivations. Concept Of Velocity Triangles and Problems.	07
IV	**Turbines:** General layout of hydroelectric plant, Turbines- classification, description of Pelton wheel turbine and Francis turbine. Unit quantities, specific speed and problems. Characteristic curves of turbine	07
V	**Centrifugal Pumps:** Definition Of Pump, Classification, Description & General Principle of Working, Priming & Methods, Work Done & Efficiencies of A Centrifugal Pump, Minimum Starting Speed, Cavitation in Centrifugal Pumps, Multistage Pumps, Problems on Centrifugal Pumps.	08

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	explain open channel flow and energy concepts in open channel flow.
CO2	solve practical fluid flow problems, to apply dimensional analysis.
CO3	apply the principles of impulse momentum equation to study impact of jet on different types of vanes.
CO4	design the sections of open channels and to choose turbine and pumps for various conditions by performance characteristics

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	1	2		1	1	1	1	1	1	1
CO2	3	3	2	3		1	1	1	1	1	1	1
CO3	2	2	2	2								
CO4	3	3	2	3		1	1	1				1

Text Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Hydraulics and Fluid Mechanics Including Hydraulic Machines	P.N. Modi and S.M. Seth	20th Edition- 2015
2	A textbook of Fluid Mechanics and Hydraulic Machines	R K Bansal	9th Edition -2017

Reference Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Elementary Hydraulics	Cruise, J.F., Singh, V.P. and Sherif,M.M.	1st Edition -2007
2	Fluid Mechanics and Hydraulic Machines	R K Rajput	6th Edition -2009

Department: Civil Engineering		**Semester:**	**4th**
Subject: Department Skill Lab - 2			
Subject Code:	**22CE406**	**L – T – P - C:**	**0-0-4-2**

Course Objectives:

Sl. No.	This Course will enable the students to
1	calibrate Flow Measuring Devices
2	determine the performance characteristics of Rotodynamic machines
3	determine the performance characteristics of centrifugal pumps
4	Set out simple curves by linear and angular methods.

Unit	Description	Hrs.
	Experiments on open channel flow	
1	Calibration of Rectangular Notch	2
2	Calibration of V-notch.	2
3	Calibration of Ogee Weir.	2
4	Calibration of Broad Crested Weir.	2
	Experiments on closed conduit flow	
1	Calibration of Venturi meter.	2
2	Determination of Darcy's Friction Factor for a Straight Pipe.	2
	Experiments on Performance of Rotodynamic Machines	
1	Performance Tests on a Single Stage/ Multi Stage Centrifugal Pump	3
2	Performance Tests on Francis Turbine.	3
	Experiments on Curve Setting	
1	Setting out of simple curve by perpendicular offset method.	3
2	Setting out of simple curve by radial offset method.	2
3	Setting out simple curves by Rankine's deflection angle method.	3

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	calibrate the various flow measuring devices
CO2	calibrate the discharge measuring devices.
CO3	find the performance of rotodynamic machines.
CO4	set out the simple curves by linear and angular methods.

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	2	1	2	2	1	-	2	1	-	1	3	1
CO2	3	2	2	2	1	1	2	1	2	1	-	1	3	2
CO3	3	2	2	2	1	1	2	1	2	1	-	1	3	2
CO4	3	1	2	1	2	2	1	-	2	1	-	1	3	1

Text Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Hydraulics and Fluid Mechanics Including Hydraulic Machines	P.N. Modi and S.M. Seth	20th Edition- 2015
2	"Surveying", Laxmi Publications, New Delhi	B C Punmia, Ashok kumar Jain and Arunkumar Jain	Volume 2, 17th Edition, 2016

Reference Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Elementary Hydraulics	Cruise, J.F., Singh, V.P. and Sherif,M.M.	1st Edition -2007
2	Fluid Mechanics and Hydraulic Machines	R K Rajput	6th Edition -2009

Department: Civil Engineering **Semester: IV**

Subject Name: SKILL DEVELOPMENT-I (T & P))

Subject Code: 22SK407 **L-T-P-C: 1-0-0-1**

Sl. No	Course Objectives
1	Improve Communication Skills: Enhance students' ability to express ideas clearly, listen actively, and adapt communication style to different contexts and audiences.
2	Foster Effective Teamwork: Develop students' teamwork skills, including cooperation, active participation, conflict resolution, and leveraging diverse strengths for collaborative success.
3	Enhance Leadership Abilities: Cultivate leadership qualities by helping students develop self-awareness, problem-solving skills, and decision-making abilities
4	Promote Professional Etiquette: Instill a sense of professionalism in students, emphasizing appropriate workplace behavior, business etiquette, and ethical conduct.

Unit	Description	Hrs
I	**Communication Skills**: Basics, Method, Means, Process and Purpose, Basics of Business Communication, Written & Oral Communication, Listening. Communication with Confidence & Clarity- Interaction with people, the need the uses and the methods, Getting phonetically correct, using politically correct language, Debate & Extempore.	6 hrs
II	**Assertive Communication-**Concept of Assertive communication, Importance and applicability of Assertive communication, Assertive Words, being assertive. **Presentation Skills-**Discussing the basic concepts of presentation skills, Articulation Skills, IQ & GK, How to make effective presentations, body language & Dress code in presentation, media of presentation	5 hrs
III	**Team Work**: Team Work and its important elements Clarifying the advantages and challenges of team work Understanding bargains in team building Defining behavior to sync with team work Stages of Team Building Features of successful teams. **Body Language & Proxemics**: Rapport Building - Gestures, postures, facial expression and body movements in different situations, Importance of Proxemics, Right personal space to maintain with different people.	5 hrs

IV	**Group discussion, Motivation and Stress Management** a. Theory & Evaluation : Understanding why and how is the group discussion conducted. b. Techniques of group discussion c. Discussion on FAQs of group discussion d. Body language during group discussion Self-motivation, group motivation, leadership abilities, Stress clauses and stress busters to handle stress and de-stress; Understanding stress - Concept of sound body and mind, Dealing with anxiety, tension, and relaxation techniques. Individual Counseling & Guidance, Career Orientation. Balancing Personal & Professional Life	6 hrs
V	**Interview Skills, Professional Practice** a. Personal and Group Interviews b. Mock Interviews - Questions asked & how to handle them c. Body language in interview d. Etiquette, Dress code in interview e. Behavioral and technical interviews f. Practice on stress interviews, technical interviews, General HR interviews **Professional Practice**: Professional Dress Code, Time Sense, Respecting People & their Space, Relevant Behavior at different Hierarchical Levels. Positive Attitude, Self Analysis and Self-Management. Professional Ethics values to be practiced, standards and codes to be adopted as professional engineers in the society for various projects. Balancing Personal & Professional Life	6 hrs

Course outcomes:

COs	Descriptions
CO1	Improved Communication Skills: Students will demonstrate enhanced verbal and written communication abilities, effectively expressing ideas, actively listening, and adapting their communication style to different situations.
CO2	Effective Teamwork and Collaboration: Students will exhibit improved teamwork skills, actively contributing to group projects, resolving conflicts constructively, and leveraging the strengths of team members to achieve shared goals.
CO3	Professional Etiquette and Conduct: Students will display professional behavior, adhering to workplace etiquette, demonstrating appropriate appearance, punctuality, and practicing ethical conduct in professional settings.
CO4	Strengthened Aptitude Skills: Students will demonstrate improved aptitude skills, including logical reasoning, analytical thinking, and problem-solving abilities, enabling them to excel in competitive exams, interviews, and real-life problem-solving scenarios

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1					2		3	3	3				
CO2	1					2		3	3	3				
CO3	1					2		3	3	3				
CO4	1					2		3	3	3				

Reference Books:

Sl No	Reference book title	Author	Volume and Year of Edition
1	Technical Communication Principles and Practices,	Meenakshi Raman and Sangeeta	Oxford Publishers, 2004
2	*Tools for Talking*	*Kerry Patterson, Joseph Grenny, Ron*	*McGraw-Hill Publication, ISBN: 9780071772204*

Department: Civil Engineering **Semester: IV**

Subject Name: CONSTITUTION OF INDIA

Subject Code: 22CI408 **L-T-P-C: 1-0-0-1**

Sl. No	Course Objectives
1	To be familiar with salient features and preamble of the constitution of India. Including fundamental rights of the citizen of India and types of Fundamental rights
2	To understand the relevance of directive principles under part-IV, and the responsibilities of the individuals towards society.
3	To understand the powers and functions of the Legislature, Executive, and judicial bodies.
4	To provide the information of FDs, Electoral Process, emergencies and amending procedures.

Unit	Description	Hrs
I	Introduction, Meaning and definitions. Salient features, Sources, Constituent Assembly, Drafting Committee. Preamble to the constitution of India.	6 hrs
II	Fundamental rights under part III – details of exercise of rights, Scopes & Limitations and, important cases	6 hrs
III	Relevance of directive principles of state policy under part-IV Fundamental duties and their significance-part-IV A	4 hrs
IV	Union Executive- President, Prime minister, Parliament and Supreme Court of India. State Executive – Governors, Chief Ministers, State legislature and High Courts.	6 hrs
V	Constitutional Special Provisions for Scheduled Castes and Tribes, Women, Children and backward classes. Emergency provisions under Part XVIII. Electoral process, Amendment procedure, 42nd, 44th, 74th, 76th, and 91stConstitutional amendments.	6 hrs

Course Outcomes

COs	Descriptions
CO1	Have general knowledge and legal literacy and thereby to take up competitive examinations
CO2	Understand the freedom, rights and restrictions including directives, through fundamental duties
CO3	Understand the importance of the three main organs of the constitution, Viz-the legislature, the executive and the judiciary.
CO4	Understand the power and functions of political institutions established throughout the country

Course Articulation Matrix:

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1						2	1	3	3	2				
CO2						2	2	3	3	2				
CO3						2	3	3	2	2				
CO4						2	2	3	3	2				

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Introduction to the Constitution of India" (student edition)	DurgaDas Basu,	EEE, 19th/20th Edn.,2001
2	An Introduction to Constitution of India	MV Pylee.	Volume-1 Vikas Publishing, 2002

Reference Books:

Sl No	Reference book title	Author	Volume and Year of Edition
1	An Introduction to Constitution of India"	Brij kishore Sharma,	prentice-Hall of India, Volume-12002
2	Constitution of India and Professional Ethics	V. Rajaram	Second Edition New Age International Publication. 2011