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/15 /UG(BE)/2024 Date: 15/07/2024

NOTIFICATION

Sub: - Ordinance pertaining to Curriculum of Undergraduate Programme Bachelor of Engineering (3rd 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 (3rd 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)

V SEMESTER B.E.

SI No.	Course Code		Course Title	Teaching dept.	L	T	P	C	CIE	SEE	Total Marks	Exam Hours
01	PC	22CE501	**Structural Analysis-I**	**CE**	4	-	-	**3**	50	50	100	3
02	PC	22CE502	**Design of RC Structures**	CE	3	-	2	**4**	50	50	100	3
03	PC	22CE503	**Geotechnical Engineering**	CE	3	-	2	**4**	50	50	100	3
04	PE	22CE5PE4x	**Professional Elective-I**	CE	4	-	-	**3**	50	50	100	3
05	OE	22CE5OE5x	**Open Elective-I**	CE	3	-	-	**3**	50	50	100	3
06	PC	22IE56x	**Institutional Elective**	**CE**	-	-	-	**2**	50	50	100	3
07	PC	22CE507	**Dept. Skill Lab-3 (Highway Lab)**	CE	1	-	4	**2**	50	50	100	3
08	HS	22SK508	**Skill Development-II (T&P) Company specific**	HS	2	-	-	**1**	50	-	50	-
L: Lecture, T-Tutorial, P-Practical/Drawing, CIE: Continuous Internal Evaluation, SEE: Semester End Examination				**Total**	**18**	**-**	**8**	**22**	**400**	**350**	750	-
Credits Distribution: Credits Distribution: Basic Science (BS)=08+08+3+3=22, Electrical Science (ES)=10+11=21, Humanities & Social Sciences (HS)=1+2+2+1=6, Program Core (PC)=02+16+16+15=49, Program Elective (PE)=03, Open Elective(OE)=03, Total Credits=20+20+21+21+22=104												

Professional Elective I:	**Open Elective I:**	**Institutional Elective:**
22CE5**PE41: Pavement Materials & Construction**	22CE5**OE51: Remote Sensing and GIS**	22IE561**: Research Methodology**
22CE5**PE42: Alternative Building Materials**	22CE5**OE52: Air Pollution and Control**	22IE562**: Management & Entrepreneurship**
22CE5**PE43: Construction Management & Entrepreneurship**	22CE5**OE53: Environmental Impact Assessment**	22IE563**: Project Management**

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:**	**V**
Subject: Structural Analysis - I			
Subject Code:	**22CE501**	**L – T – P - C:**	**3-0-0-3**

Course Objectives:

Sl. No.	This Course will enable the students to
1	Apply knowledge of mathematics and basics of structures in calculating slope and deflections.
2	Analyze the numerical on three hinged arches.
3	Analyze structural systems like cables in bridges.
4	Analyze the concepts of moving loads and influence lines

Unit	Description	Hrs.
I	**Introduction:** Forms of structures, linear and nonlinear structures, one, two and three dimensional structures, Determinate and Indeterminate structures, Degree of freedom, Degree of redundancy. **Deflection of Beams:** Moment area theorems, Deflection and slope of determinate beams by using moment area theorem.	8
II	**Deflection of Beams:** Deflection and slope of determinate beams by using conjugate beam principles.	7
III	**Three Hinged Arches:** Introduction to arches, Theoretical arch and actual arch, Eddy's theorem, Reactions, Bending moment, Normal thrust and Radial shear. Bending moment diagrams for arches with supports at the same level and at different levels. (Parabolic and circular).	9
IV	**Cables:** Introduction to cables Supports and reactions, Problems on Tension in the cable supported at same and different levels.	8
V	**Moving loads and influence lines:** Introduction to moving loads. Maximum shear force, maximum bending moment at any section in a beam. Absolute maximum bending moment. Condition for maximum bending moment and absolute maximum bending moment and Equivalent uniformly distributed load. Condition for maximum bending moment at any given section due to point loads, UDL greater a span and UDL shorter than the span.	7

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	Analyze the slope and deflections of determinate structures.
CO2	Apply the structural concepts of arch and arch action.
CO3	Apply the Concepts of Cables.
CO4	Analyze structural systems using the concepts of ILD and moving loads.

Course Articulation Matrix:

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

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Structural Analysis	L S Negi and R S Jangid	Tata Mc Graw- Hill
2	" Basic structural Analysis"	C.S Reddy	Tata Mc Graw-Hill,1996

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Strength of Materials and Theory of Structures	B.C.Punmia and R.K.Jain	Laxmi Publication, New Delhi.
2	Indeterminate Structural Analysis	J.Sterling Kinney	Oxford and IBH Publishing Co

Department: Civil Engineering		**Semester:**	**V**
Subject: Design of RC Structures			
Subject Code:	**22CE502**	**L – T – P - C:**	**3-0-2-4**

Course Objectives:

Sl. No.	This course will enable the students to
1	Identify, formulate, and solve engineering problems of RC elements subjected to different kinds of loading.
2	Follow procedural knowledge in designing various structural RC elements.
3	Impart the culture of following the codes for strength, serviceability, and durability as an ethics.
4	Provide knowledge in the analysis and design of RC elements by using commercially available software.

Unit	Description	Hrs.
I	**Introduction to Limit State Design and Serviceability:** History and concept of RC design. Philosophy and principle of limit state design with assumptions. Partial Safety factors, Characteristic load, and strength. Stress block parameters, the concept of balanced section, under reinforced and over reinforced section. Short-term deflection and long-term deflection (Definition only).	8
II	**Limit State Analysis of Beams:** Analysis of singly reinforced and doubly reinforced beams for flexure and shear.	8
III	**Limit State Design of Beams:** Design of singly and doubly reinforced beams for flexure and shear, as per IS456-2000. Check for deflection.	8
IV	**Limit State Design of Slabs and Stairs:** Introduction to one-way and two-way slabs, Design of cantilever, simply supported and one-way continuous slab. Design of two-way slabs for different boundary conditions. Design of doglegged staircase. Importance of bond, anchorage length, and lap length. Check for deflection.	7
V	**Limit State Design of Columns and Footings:** Analysis and design of short axially loaded RC column. Design of columns with uniaxial and biaxial moments, Design concepts of the footings. Design of rectangular and square column footings with axial load and also for axial load & moment.	8
Preparing spreadsheets using MS Excel		
1	Introduction to MS Excel	3
2	Design of a Singly Reinforced Beam with Different Support Conditions	3
3	Design of columns with different geometrical conditions	3
4	Design of footings	4

Course Outcomes:

Course Outcomes	At the end of the course, students will be able to
CO1	understand the fundamentals of design philosophy and Principles
CO2	Solve Engineering problems of RC elements subjected to flexure, shear, and torsion
CO3	Demonstrate procedural knowledge in designs of RC structural elements such as slabs, columns, and, footings and compare the results with analytical results by using commercially available software.
CO4	Own professional and ethical responsibility.

Course Articulation Matrix:

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

Text Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Reinforced Concrete Design	N Krishna Raju and R N Pranesh	2018
2	RCC designs	Dr.B C Punmia Er Ashok Kumar Jain and Dr Arun K Jain	2006

Reference Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Reinforced Concrete Design	Unnikrishnan	3rd Edition2017
2	Limit State design of reinforced concrete	P C Varghese	2nd Edition 2008
3	IS 456-2000, SP-16 and SP-34		

Department: Civil Engineering		**Semester:**	**V**
Subject: Basic Geotechnical Engineering			
Subject Code:	**22CE503**	**L – T – P - C:**	**3-0-2-4**

Course Objectives:

Sl. No.	This Course will enable the students to
1	Understand basic concepts of soil mechanics as an integral part in the knowledge of civil engineering.
2	Comprehend the engineering properties of different types of soil and to be familiar with the mechanical behaviour of soils.
3	Be broadly familiar with geotechnical engineering problems such as flow of water and terminologies associated with soil mechanics.
4	Assess the strength-deformation and consolidation characteristics of soils.

Unit	Description	Hrs.
I	**Introduction:** Introduction to soil mechanics, definition, origin and formation of soil, phase diagram with inter relationships between index properties, laboratory determination of moisture content, specific gravity, relative density, consistency limits and indices, in-situ density, particle size distribution by sieve analysis and IS plasticity chart. Numerical problems on above. Soil structure, common clay minerals- montmorillonite, kaolinite, halloysite and illite.	8
II	**Flow of water:** Darcy's law with assumptions, coefficient of permeability and its determination, factors affecting permeability, seepage velocity, superficial velocity, permeability of stratified soils, concept of total stress, effective stress and pore stress. Quick sand phenomena and capillary phenomena. Numerical problems on permeability of soils.	8
III	**Compaction:** Definition, Principle, factors affecting compaction, field compaction control - compactive effort & method of compaction, lift thickness and number of passes. Compacting equipments and their suitability. Numerical problems on above.	7

IV	**Consolidation:** Definition, Terzaghi's one dimensional consolidation theory-assumption, types of consolidation, determination of Consolidation characteristics (C_c, a_v, m_v, C_v) by square root of time fitting and logarithmic time fitting and Numerical problems on consolidation. Determination of Pre-consolidation pressure by Casagrande's method. Simple problems on consolidation.	8
V	**Shear Strength:** Mohr-coulomb theory, factors affecting shear strength, Determination of shear strength by direct shear test, unconfined compression test and triaxial compression test. Numerical problems on above. Thixotropy and sensitivity. Tests under different drainage conditions.	8
Laboratory Experiments to be conducted i. Determination of moisture content and specific gravity ii. Grain size analysis of soil sample by dry sieve analysis iii. Determination of in situ density by core cutter and sand replacement method iv. Determination of consistency limits-liquid limit and plastic limit v. Determination of compaction characteristics by light compaction test		13

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	Determine the index properties in classifying the soils based on index properties and plasticity chart.
CO2	Determine compaction characteristics and permeability of soils and acquire conceptual knowledge about stresses due to seepage and effective stress.
CO3	Solve practical problems related to estimation of consolidation settlement of soil.
CO4	Estimate shear strength parameters of different types of soils using the data of different shear tests and comprehend Mohr-Coulomb failure theory.

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	2	2	2	3	1	1		1		
CO2	3	3	3		2	3	2	3	1	1	1	1		
CO3	3	3	2	3	2	3	2	2		1	2	1		
CO4	3	3	3	3	3	3	3	3	1	1	1	2		

Text Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	"Basic and Applied Soil mechanics", New Age Publishers and Distributors, New Delhi.	Gopal Ranjan and A S R Rao	2nd Edition, 2009
2	"Geotechnical Engineering", New Age Publications, New Delhi	Venkatramaiah C	3rd Edition, 2009

Reference Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	"Soil Mechanics And Foundation Engineering", UBS Publishers And Distributors, New Delhi.	V N S Murthy	2nd Edition, 2009
2	"Soil Mechanics Fundamentals", John Wiley And Sons Publications, New York.	Muni Budhu and Wiley Blackwell	2nd Edition, 2009

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:**	**V**
Subject: Pavement Materials and Construction				
Subject Code:	**22CEPE541**		**L – T – P - C:**	**3–0–0–3**

Sl. No	Course Objectives
1	To help students understand the classification and properties of subgrade soil and aggregates.
2	To help students understand the material characterization of bitumen, tar, emulsion, and cutback.
3	To help students understand various construction equipment with respect to principles, advantages, suitability, and limitations.
4	To help students understand the construction steps and specifications of flexible and rigid pavements.

Unit	Description	Hrs
I	**Pavement Materials** **Subgrade soil-** Desirable properties, HRB soil classification, determination of CBR and modulus of sub grade reaction with Problems. **Coarse Aggregates -** Classification based on origin, Requirements, tests on Road aggregates. **Bitumen and Tar -** Origin, Preparation, types, Requirements, tests on bitumen and tar, difference between bitumen & tar.	**6**
II	**Bituminous emulsion & Cutbacks and Modified Bitumen**- Preparation, classification, tests and uses. Adhesion of bitumen binders to road aggregates, Mechanism of stripping, bitumen adhesion tests. **Bituminous mixes**: Requirements, Mechanical properties, Steps involved in design of bituminous mix-BM, DBM, BC, Marshall method of mix design, volumetric properties, Problems on determination of OBC.	**9**
III	**Equipment in highway construction**: Various types of equipment for excavation, grading and compaction- their working principles, advantages and limitations. Special equipment for bituminous and cement concrete pavement construction. **Sub grade**: Site clearance, Earthwork cutting and Filling, Construction of embankments, Preparation of subgrade, quality control tests.	**8**
IV	**Pavement Construction:** **Flexible Pavement Construction**: Specification and construction of i) Granular Sub base, ii) WBM Base iii) WMM iv) Bituminous Macadam v) Dense Bituminous Macadam vi) Bituminous Concrete **Bituminous constructions:** Prime coat and Tack coat, Surface dressing and seal coat, Bituminous carpet.	**7**
V	**Rigid Pavement Construction:** Specification and construction of i) Dry Lean Concrete sub base and PQC ii) Prestressed concrete pavements **Rigid pavement Joints**- Types of joints and arrangements. Types of Joint fillers and ideal requirements, Design of joints.	**9**

Course Outcomes:

Course outcome	Descriptions
	After studying this course Students will be able to
CO1	**Analyze** subgrade soil, aggregates, and bitumen properties, and interpret key tests like CBR and modulus of subgrade reaction.
CO2	**Evaluate** the suitability of pavement materials and compare flexible and rigid pavement construction methods.
CO3	**Design** bituminous mixes using the Marshall method to determine optimal binder content and ensure mix performance.
CO4	**Apply** appropriate construction techniques and equipment for building flexible and rigid pavements.

Course Articulation Matrix

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

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	S K Khanna and C E G Justo	Highway Engineering	2018
2	MoRT&H Specifications for Roads and Bridges	---	5th Edition, 2001

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	L R Kadiyali	Highway Engineering	2019
2	K.P.Subramanium	Transportation Engineering I	2016
3	R Srinivasa Kumar	Highway Engineering	2015

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:**	**V**
Subject: Alternate Building materials			
Subject Code:	**22CE5PE42**	**L – T – P - C:**	**3-0-0-3**

Course Objectives:

Sl. No.	This Course will enable the students to
1	Understand environmental issues due to building materials and the energy consumption in manufacturing building materials
2	Study the various masonry blocks, masonry mortar and structural behavior of masonry under compression.
3	Study the alternative building materials in the present context.
4	Understand the alternative building technologies which are followed in present construction field.

Unit	Description	Hrs.
I	**Introduction:** Energy in building materials, Environmental issues concerned to building materials, Embodied energy in building materials, Global warming- causes, effects on the environment, Green concepts in buildings, Green building ratings – IGBC and LEED manuals – mandatory requirements, Rainwater harvesting & solar passive building construction.	
II	**Structural Masonry:** Types of mortars, classification of mortars as per BIS, characteristics and requirements of mortar, selection of mortar. Uses of masonry, masonry bonding, Compressive strength of masonry elements, Factors affecting compressive strength, Elastic properties of masonry materials and masonry, Design of masonry compression elements subjected to axial load.	
III	**Alternate Building Materials:** Lime, Pozzolana cements, Raw materials, Manufacturing process, Properties and uses. Fibers- metal and synthetic, Properties and applications. Fiber reinforced plastics, Matrix materials, Fibers organic and synthetic, Properties and applications. Building materials from agro and industrial wastes. Types of agro wastes, Types of industrial and mine wastes, Properties and applications. Masonry blocks using industrial wastes. Construction and demolition wastes.	
IV	**Alternate Building Technologies:** Use of arches in foundation, alternatives for wall constructions, composite masonry, confined masonry, cavity walls, rammed earth, Ferro cement and ferroconcrete building components, Materials and specifications, Properties, Construction methods, Applications. Top down construction, Mivan Construction Technique.	
V	**Equipment for Production of Alternate Materials:** Machines for manufacture of concrete, Equipment's for production of stabilized blocks, Moulds and methods of production of precast elements, Cost concepts in buildings, Cost saving techniques in planning, design and construction, Cost analysis: Case studies using alternatives.	

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	Solve the problems of Environmental issues concerned to building materials and cost effective building technologies.
CO2	Select appropriate type of masonry unit and mortar for civil engineering constructions; also they are able to design structural masonry elements under axial compression.
CO3	Analyse different alternative building materials which will be suitable for specific climate and in an environmentally sustainable manner. Also capable of suggesting suitable agro and industrial wastes as a building material.
CO4	Recommend various types of alternative building material and technologies and design a energy efficient building by considering local climatic condition and building material.

Course Articulation Matrix:

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

Text Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	"Alternative Building Materials	KS Jagadish, B V Venkatarama Reddy and K S Nanjunda Rao,	New Age International pub.
2	"Structural Masonry"	Arnold W Hendry,	Macmillan Publishers.

Reference Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Building Materials in Developing Countries	RJS Spence and DJ Cook,	Wiley pub.
2	Green Building Rating System	LEED India	IGBC pub.

Department: Civil Engineering **Semester: VI**

Subject Name: CONSTRUCTION MANAGEMENT AND ENTREPRENEURSHIP

Subject Code: 22CE5PE43 **L-T-P-C:3-0-0-3**

Sl.No	Course Objectives
1	This course will provide students to Understand the concept of planning, scheduling, cost and quality control, safety during construction.
2	This course will provide students to Understand the concept of organization and use of project information necessary for construction project.
3	This course will provide students to Inculcate Human values to grow as responsible human beings with proper personality.
4	This course will provide students to Keep up ethical conduct and discharge professional duties.

UNIT	Description	Hours
I	**Construction Project Formulation:** Introduction to construction management, project organization, management functions, management styles. **Construction Planning and Scheduling:** Introduction, types of project plans, work breakdown structure, Grant Chart, preparation of network diagram- event and activity based and its critical path- critical path method, PERT method, concept of activity on arrow and activity on node.	8
II	**Resource Management:** Basic concepts of resource management, class of lab our, Wages & statutory requirement, Labour Production rate or Productivity, Factors affecting labour output or productivity. **Construction Equipments:** classification of construction equipment, estimation of productivity for: excavator, dozer, compactors, graders and dumpers. Estimation of ownership cost, operational and maintenance cost of construction equipments. Selection of construction equipment and basic concept on equipment maintenance	8

III	**Construction Quality , safety and Human Values:** Construction quality process, inspection, quality control and quality assurance, cost of quality, ISO standards. Introduction to concept of Total Quality Management **HSE:** Introduction to concepts of HSE as applicable to Construction. Importance of safety in construction , Safety measures to be taken during Excavation , Explosives , drilling and blasting , hot bituminous works , scaffolds / platforms / ladder , form work and equipment operation. Storage of materials. Safety through legislation, safety campaign. Insurances.	8
IV	**Introduction to engineering economy:** Principles of engineering economics, concept on Micro and macro analysis, problem solving and decision making. **Interest and time value of money:** concept of simple and compound interest, interest formula for: single payment, equal payment and uniform gradient series. Nominal and effective interest rates, deferred annuities, capitalized cost.	8
V	**Entrepreneurship:** Evolution of the concept, functions of an entrepreneur, concepts of entrepreneurship, stages in entrepreneurial process, different sources of finance for entrepreneur, central and state level financial institutions. Micro, Small & Medium Enterprises (MSME): definition, characteristics, objectives, scope, role of MSME in economic development, advantages of MSME, Introduction to different schemes: TECKSOK, KIADB, KSSIDC, DIC, Single Window Agency: SISI, NSIC, SIDBI, KSFC.	7

Course outcome	Descriptions
CO1	This course will enable students to Prepare a project plan based on requirements and prepare schedule of a project by understanding the activities and their
CO2	This course will enable students to Apply labour output, equipment efficiency to allocate resources required for an activity / project to achieve desired quality
CO3	This course will enable students to Analyze the economics of alternatives and evaluate benefits and profits of a construction activity based on monetary value
CO4	This course will enable students to Establish as an ethical entrepreneur and establish an enterprise utilizing the provisions offered by the federal agencies.

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	"Principles of Management"	P C Tripathi and P N Reddy,	Tata McGraw-Hill Education
2	"Construction Project Management: Planning Scheduling and Control"	Chitkara, K.K,	Tata McGraw Hill Publishing Company, New Delhi.

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	"Entrepreneurship Development and Small Business Enterprise"	Poornima M. Charantimath	Dorling Kindersley (India) Pvt. Ltd., Licensees of Pearson Education
2	"Construction Planning and Management"	Dr. U.K. Shrivastava	Galgotia publications Pvt. Ltd. New Delhi.

Department: Civil Engineering		**Semester:**	**V**
Subject: Remote Sensing and GIS			
Subject Code:	**22CE5OE51**	**L – T – P - C:**	**3-0-0-3**

Course Objectives:

Sl. No.	This Course will enable the students to
1	Understand the basic concepts of remote sensing.
2	Analyze satellite imagery and extract the required units.
3	Extract the GIS data and prepare the thematic maps.
4	Use the thematic maps for various applications.

Unit	Description	Hrs.
I	**EMR and its interaction with atmosphere:** Introduction to remote sensing, components of Remote sensing, electromagnetic radiation-sources, electromagnetic spectrum, types-active and passive, energy interaction in atmosphere-absorption, transmission and scattering, Energy interactions with earth's surface-spectral reflectance curves. Applications of remote sensing.	8
II	**Platforms:** Introduction, types of platforms-ground borne, air borne and space borne. Sensors, characters of sensors, types-active and passive. **Sensors:** Sensor parameters-spectral resolution, spatial resolution, thermal resolution and radiometric resolution. Satellites-types, Indian satellites.	8
III	**Image Interpretation and Analysis:** Introduction, basic elements of image interpretation and visual interpretation keys. **Digital Image Processing:** Introduction to, stages involved in DIP-preprocessing, image enhancement, image transformations, image classification and analysis. Corrections-radiometric, geometric. Sources of errors in image processing.	8
IV	**Geographic Information System:** Definition, basic components of a GIS, sub-systems of GIS, types and functions. Types of GIS data- attribute and spatial, data models-raster and vector. Maps in GIS and its types. Applications of GIS.	7
V	**Data Management:** Introduction to data base management systems-functions, components of DBMS, Building GIS Worlds-LCGU based GIS, layer based GIS, feature based GIS and object oriented GIS. Storage of GIS data- hybrid data model and integrated data model.	8

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	Understand the concept of remote sensing and its applications.
CO2	Know the importance of platforms and sensors.
CO3	Familiar with the concept of digital image processing and interpretation analysis.
CO4	Know the components of GIS, applications and data management in GIS.

Course Articulation Matrix:

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

Text Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	"Remote Sensing and Geographical Information Systems", B S Publications.	M Anji Reddy	Volume 1, 4th Edition, 2019
2	"Basics of Remote Sensing and GIS", Laxmi Publications, New Delhi.	S Kumar	3rd Edition, 2019

Reference Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	"Remote sensing and image interpretation", John Wiley and Sons, New york.	Thomas Lillesand, Kiefer and Chipman	7th Edition, 2015
2	"Fundamentals of Remote sensing", University press publishers, New Delhi	George Joseph and C Jeganathan	3rd Edition, 2018

Department: Civil Engineering		**Semester:**	**5**
Subject: AIR POLLUTION AND CONTROL			
Subject Code: 22CE5OE52		**L – T – P - C:**	**3-0-0-3**

Course Objectives:

Sl. No	This course will enable the students to
1	Study the sources and effects of air pollution
2	Learn the meteorological factors influencing air pollution
3	Learn sampling and control technologies of air pollutants, Auto mobile air pollution and also noise pollution
4	Know about environmental issues, Acts and guidelines

Unit	Description	Hrs
I	**Introduction**: Definition of air pollution, Composition & structure of atmosphere, Emission Sources, Classification of atmospheric pollutants, Photo-chemical Smog, Coal-induced smog, **Air Pollution Episodes**: London Smog, Los Angeles Smog & Bhopal Gas Tragedy, Factors to be considered in industrial plant location., case study of polluted metropolitan cities in India	8
II	**Effects of Air Pollution**: On Human Health, Animals, Plants and Materials **Meteorology:** Introduction, Meteorological Variables, Lapse Rate, Temperature Inversions, Atmospheric Stability Conditions, Wind rose, maximum mixing depth, General Characteristics of Stack Plumes, Gaussian dispersion model(only sketch and expression)	8
III	**Sampling and Control**: Sampling of Gaseous and Particulate matter, Stack Sampling, Smoke and its Measurement Particulate Emission Control: Gravitational Settling Chambers, Cyclone Separators, Fabric Filters, Electrostatic Precipitators, Wet Scrubbers, Control of Gaseous pollutant: Adsorption by solids, Absorption by liquids Urban green belt concept: Biological species for Carbon sequestration, Importance of lung space	8
IV	**Air Pollution Due To Automobiles:** Air Pollution due to Gasoline Driven and Diesel Driven Engines, Mechanism of pollutant emission, Effects & control of automobile emission. Point and non point source of air pollution, Heat island effect.	7

	Noise pollution: Sources, measurement, effects, standards & control	
V	**Burning Environmental Issues:** 1. Acid Rain 2. Global Warming & Ozone Depletion in Stratosphere 3. Indoor Air Pollution 4. CPCB guidelines to control Air pollution & Air act 1981, standards. Organizations involved in pollution control: CPCB, SPCB, NGT (key roles and responsibilities) 5. Air quality index	8

Course Outcomes:

Course outcome	At the end of the course students will be able to
CO1	Classify air pollutant, sources and its characteristics , behavior of air pollutants and its effect of human health and environment
CO2	Understand the meteorological aspects, Able to understand the concept of Pollutant sampling,
CO3	Understand the concepts of Particulate and gaseous emission control technologies its applications and air pollution due to automobiles
CO4	Understand the concept of noise pollution and environmental laws to apply the knowledge in controlling current environmental issues

Course Articulation Matrix

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

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	"Air pollution"	M. N. Rao and H V N Rao	Tata Mc-G raw Hill Publication.2015
2	Text book of Air Pollution and Control Technologies	Anjaneyulu Y	Allied Publishers,2002

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	"Air Pollution Control Engineering"	Crawford, M	Tata Mc-G raw Hill Publication.
2	Environmental Engineering	Peavy,H S,Rowe and tchobanoglous G	McGraw-Hill Co

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:**	**5**
Subject: Environmental Impact Assessment				
Subject Code: 22CE5OE53			**L – T – P - C:**	**3-0-0-3**

Course Objectives:

Sl. No	This course will enable the students to
1	Study and apply-Environmental Impact Assessment- for various developmental projects.
2	Understand-Public participation in environmental decision making. Practical considerations in preparing Environmental Impact Assessment and Statements.
3	Learn Salient features of the project activity - Environmental parameter - Activity relationships - matrices. EIA for various industrial projects
4	Understand current environmental issues, rules and regulations in protecting environment.

Unit	Description	Hrs
I	**Ecology:** Definition**,** Classification of Ecosystem, Structure and functions of ecosystems, basic terminology concepts of Ecology. Biotic and Abiotic components, Ecological Niche and succession. Population Ecology, community Ecology, Habitat Ecology. Biogeochemical cycles, Ecological pyramids.	8
II	Environmental Impact Assessment: Definition, Types-Rapid and Comprehensive EIA, EIS, FONSI. Need for EIA Studies, Baseline Information. Objectives and Scope, Contents of EIA, Methodologies and Step by step procedure of EIA, Limitations of EIA, Nutrient enrichment – Analysis of Eutrophication, Control of Eutrophication.	8
III	**Frame work of Impact Assessment.** EIA guidelines for Development Projects-Environmental Setting, Techniques of EIA. Assessment and Prediction of Impacts on Attributes: Air, Water, Noise, Land Ecology, Soil. Public participation in EIA, Environmental management plan, disaster management plan.	8
IV	**Practical Considerations in preparing Environmental Impact Assessment and Statements**. Salient Features of the Project Activity-Environmental Parameter Activity Relationships- Matrices, EIA for Water resource developmental projects, Highway projects, airport, Mining project (Coal, Iron Ore), Thermal Power Plant, Construction project.	8
V	**Environmental legislation:** EIA notification rules and regulations, green tribunal, National environmental policy, Forest and wild life protection acts, Interlinking of rivers in India-case study, Sustainable development. SEIA	7

Course Outcomes:

Course outcome	At the end of the course students will be able to
CO1	Know about the ecology and ecosystem and its components.
CO2	Know different steps and statements used in EIA procedure. The students able to explain strategy of different EIA methodology.
CO3	Understand about EMP and attributes also Students able to conduct EIA for different projects.
CO4	Know about environment laws, rules and regulations

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			2	3		
CO2	3	2				3	2	2			1	1		
CO3	3	3				3	2	1	3	3	3	1		
CO4	2	3				2	2	1	2	3	2	1		

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Environmental impact assessment methodologies	Y Anjaneyulu and valli manickam	B S publications 2010
2	Environmental Impact Assessment McGraw Hill	Canter L	2007

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Concepts of Ecology	Kormondy	Prentice hall publication
2	Environmental impact analysis	Jain R K	McGraw Hill publications, 2015

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: Humanities and Sciences		**Semester:**	**FIFTH Semester**
Subject: Research Methodology (Institutional Elective)			
Subject Code:	**22IE561**	**L – T – P - C:**	**2 – 0 – 0 – 2**

Sl. No	Course Objectives
1	To give an overview of the research methodology and explain the technique of defining a research problem.
2	To explain carrying out a literature search, its review and to explain various research designs and their characteristics.
3	To explain the details of sampling designs, and also different methods of data collections.
4	To develop theoretical, conceptual frameworks, writing a review, to explain the art of interpretation and the art of writing research reports.

COURSE TOPICS: The course has 28 lecture hours in 5 Units. 2- Lecture hours per week of 1-hour duration.

Unit	Description	Hrs
I	**Research Methodology:** Introduction, Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Research Approaches, Significance of Research, Research Methods versus Methodology, Research and Scientific Method, Importance of Knowing How Research is Done, Research Process, Criteria of Good Research, and Problems Encountered by Researchers in India. **Defining the Research Problem:** Research Problem, Selecting the Problem, Necessity of Defining the Problem, Technique Involved in Defining a Problem, An Illustration. **Bloom's Taxonomy Level:** L_1 – Remembering, L_2 – Understanding.	**6 hrs**
II	**Reviewing the literature:** Place of the literature review in research, Bringing clarity and focus to your research problem, Improving research methodology, Broadening knowledge base in research area, Enabling contextual findings, How to review the literature, searching the existing literature, reviewing the selected literature, Developing a theoretical framework, Developing a conceptual framework, Writing about the literature reviewed. **Bloom's Taxonomy Level:** L_1 – Remembering, L_2 – Understanding.	**5 hrs**
III	**Research Design:** Meaning of Research Design, Need for Research Design, Features of a Good Design, Important Concepts Relating to Research Design, Different Research Designs, Basic Principles of Experimental Designs, Important Experimental Designs. **Design of Sample Surveys:** Introduction, Sample Design, Sampling and Non-sampling Errors, Sample Survey versus Census Survey, Types of Sampling Designs. **Bloom's Taxonomy Level:** L_1 – Remembering, L_2 – Understanding.	**7hrs**
IV	**Data Collection**: Experimental and Surveys, Collection of Primary and Secondary Data, Selection of Appropriate Method for Data Collection, Case Study Method. **Hypothesis**- Basic concepts, types of hypothesis, Formulation of hypothesis, testing of hypothesis, Analysis of data, **Interpretation of data-** Meaning of Interpretation, Technique of Interpretation, Precaution in Interpretation, Editing, classification and tabulation. **Bloom's Taxonomy Level:** L_1 – Remembering, L_2 – Understanding.	**6hrs**
V	**Report Writing:** Significance of Report Writing, Different Steps in Writing Report, Layout. Types of Reports, Oral Presentation, Mechanics of Writing a Research Report, Precautions for Writing Research Reports. Research ethics, Citations, Similarity check. **Bloom's Taxonomy Level:** L_1 – Remembering, L_2 – Understanding, L_3 – Applying, L_4 – Analyzing.	**4hrs**

Course Outcomes:

Course outcome	Descriptions
	At the end of the course the student will be able to:
CO1	Discuss research methodology and the technique of defining a research problem
CO2	Explain the functions of the literature review in research, carrying out a literature search
CO3	Developing theoretical and conceptual frameworks and writing a review
CO4	Explain various research designs, their characteristics. explain the art of interpretation and the art of writing research reports

Course Articulation Matrix

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

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Research Methodology: Methods and Techniques	C.R. Kothari, Gaurav Garg	New Age International 4th Edition, 2018
2	Research Methodology a step-by-step guide for beginners. (For the topic Reviewing the literature under module 2	Ranjit Kumar	SAGE Publications Ltd. 3rd Edition, 2011

Reference Books:

Sl No	Reference Book Title	Author	Volume and Year of Edition
1	Research Methods: the concise knowledge base	Trochim	Atomic Dog Publishing2005
2	Conducting Research Literature Reviews: From the Internet to Paper	Fink A	Sage Publications 2009

Question paper pattern: The question paper will have TEN questions. There will be TWO questions from each unit. Each question will have questions covering all the topics under a unit. The students will have to answer FIVE full questions, selecting ONE full question from each unit.

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: Humanities and Sciences		**Semester:**	**FIFTH Semester**
Subject: Management and Entrepreneurship(Institutional Elective)			
Subject Code:	**22IE562**	**L – T – P - C:**	**2 – 0 – 0 – 2**

Sl. No	Course Objectives
1	Explain fundamentals of management, functions of a manager. Also explain planning, organizing, and staffing, decision making processes and explain the organizational structure
2	Describe the understanding of motivation and different control systems in management, leadership process, understanding of Entrepreneurship and its development process
3	Illustrate Small Scale Industries, various types of supporting agencies and financing available for an entrepreneur and summarize the preparation of project report, need significance of report. Also to explain about industrial ownership
4	To explain various forms of the intellectual property, its relevance and business impact in the changing global business environment and to discuss leading International Instruments concerning Intellectual Property Rights

COURSE TOPICS: The course has 28 lecture hours in 5 Units, 2- Lecture hours per week of 1-hour duration.

Unit	Description	Hrs
I	**Introduction** - Meaning, nature and characteristics of management, scope and Functional areas of management, goals of management, levels of management, **Planning-** Nature, importance, types of plans, steps in planning, **Organizing**- nature and purpose, types of Organization, Staffing- meaning, process of recruitment and selection. **Directing and controlling**- meaning and nature of directing, leadership styles, motivation Theories, Communication- Meaning and importance, Coordination meaning and importance, Controlling- meaning, steps in controlling, methods of establishing control. **Bloom's Taxonomy Level:** L_1 – Remembering, L_2 – Understanding.	**6 hrs**
II	**Entrepreneur** – meaning of entrepreneur, characteristics of entrepreneurs, classification and types of entrepreneurs, various stages in entrepreneurial process, role of entrepreneurs in economic development, entrepreneurship in India and barriers to entrepreneurship. Identification of business opportunities, market feasibility study, technical feasibility study, financial feasibility study and social feasibility study. **Bloom's Taxonomy Level:** L_1 – Remembering, L_2 – Understanding.	**5 hrs**
III	**Preparation of project and ERP (Enterprise resource planning)** - meaning of project, project identification, project selection, project report, need and significance of project report, contents, formulation, guidelines by planning commission for project report, Enterprise Resource Planning: Meaning and Importance- ERP and Functional areas of Management – Marketing / Sales- Supply Chain Management – Finance and Accounting – Human Resources – Types of reports and methods of report generation. **Bloom's Taxonomy Level:** L_1 – Remembering, L_2 – Understanding.	**5hrs**
IV	**Micro and Small Enterprises**: Definition of micro and small enterprises, characteristics and advantages of micro and small enterprises, steps in establishing micro and small enterprises, Government of India indusial policy 2007 on micro and small enterprises, case studies in respective domains. Institutional support: MSME-DI, NSIC, SIDBI, KIADB, KSSIDC, TECSOK, KSFC, DIC and District level single window agency. **Bloom's Taxonomy Level:** L_1 – Remembering, L_2 – Understanding.	**6hrs**

	Intellectual Property: Introduction to IP**:** Importance of IPR, International conventions / agreements / treaties, Origin of IP law and history, laws related to IP in India: Indian Patent Act 1970, WIPO. **Patents:** Criteria for patentability, patentable and non-Patentable Matters, introduction to Prior Art Search, types of patent application: ordinary, convention, PCT, divisional and Patent of addition, filing procedure, drafting complete specification and claims. **Copyright:** Criteria, filing procedure, Copyright Infringement, rights of authorship and ownership, Fair Use, first sale doctrine, moral rights and economic rights. **Trademarks:** definition, eligibility Criteria, types of patents, filing procedure, Classification of Trademarks and well-known mark **Geographical Indications:** Definitions, importance, filing procedure, GI ecosystem in India and case laws **Industrial design:** eligibility criteria, Non-Protectable Industrial Designs India, Procedure for Registration, importance of design registration. **Bloom's Taxonomy Level:** L_1 – Remembering, L_2 – Understanding.	**6hrs**

Course Outcomes:

Course outcome	Descriptions
CO1	Explain management functions of a manager. Also explain planning and decision making processes. Organizational structure, staffing and leadership processes
CO2	Describe the understanding of motivation and different control systems in management and understanding of Entrepreneurships and its development process
CO3	Illustrate Small Scale Industries, various types of supporting agencies and financing available for an entrepreneur. Summarize the preparation of project report, need significance of report
CO4	Shall get an adequate knowledge on patent and copyright for their innovative research works and provide further the way for developing their idea for innovations

Course Articulation Matrix

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

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Principles of Management	P. C. Tripathi, P. N. Reddy	Tata McGraw Hill, 4th / 6th Edition, 2010.
2	Intellectual property rights - Unleashing the knowledge economy	Pmbuddha Ganguli	Tata Mccraw HiU Publishing Company Ltd

Reference Books:

Sl No	Reference Book Title	Author	Volume and Year of Edition
1	Management and Entrepreneurship	Kanishka Bedi	Oxford University Press-2017
2	Entrepreneurship Development	S S Khanka	S Chand & Co.
3	Dynamics of Entrepreneurial Development & Management -	Vasant Desai	Himalaya Publishing House

Question paper pattern: The question paper will have TEN questions. There will be TWO questions from each unit. Each question will have questions covering all the topics under a unit. The students will have to answer FIVE full questions, selecting ONE full question from each unit.

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: Humanities and Sciences		**Semester:**	**V**
Subject: Project Management (Institutional Elective)			
Subject Code:	**22IE563**	**L – T – P - C:**	**2 – 0 – 0 – 2**

Sl. No	Course Objectives
1	To understand the scope, timing and quality of the project, and to analyze the project goals, constraints, deliverables, performance criteria, control needs and resource requirement in consultation with stake holders
2	To implement the process of project management, life cycle and the embodied concepts, tools and techniques in order to achieve project success
3	To understand the team efforts and stakeholders in professional manner, respecting differences, to ensure a collaborative project environment
4	To apply project management practices to new programs, initiatives, products, services and events relative to the needs of stakeholders

COURSE TOPICS: The course has 28 lecture hours in 5 Units, 2- Lecture hours per week of 1-hour duration.

Unit	Description	Hrs
I	**Introduction:** Project, Program, and portfolio, Operations management, Product life cycle, Project life cycle, Project management life cycle, Role of project manager and office, Ten Project Knowledge areas with their associated processes **Project Integration Management**: Develop project charter, Develop project management plan, Direct & manage project work, Monitor control project, Perform integrated change control, Close project / phase. **Bloom's Taxonomy Level:** L_1 – Remembering, L_2 – Understanding. L3-Analyzing	**6hrs**
II	**Project scope management:** Plan scope management, Collect requirements, Define scope, Create WBS (Work Breakdown Structure), Validate Scope, Control scope. **Project Schedule management**: **Plan Schedule management** Define activities, Sequence activities, Estimate activity durations, Develop schedule, and Control schedule. **Bloom's Taxonomy Level:** L_1 – Remembering, L_2 – Understanding. L3-Analyzing	**5hrs**
III	**Project cost management:** Plan cost management, Estimate cost, Determine budget, and Control costs. Project quality management: Plan quality management, Manage quality and Control quality **Project resource management:** Plan resource management, Estimate activity resources, Acquire resources, Develop team, Manage team and Control resources. **Bloom's Taxonomy Level:** L_1 – Remembering, L_2 – Understanding. L3-Analyzing	**6 hrs**
IV	**Project communication management:** Plan communication management , Manage communications and Monitor communications **Project risk management:** Plan risk management, Identify risks, Perform qualitative risk analysis, Perform quantitative risk analysis, Plan risk responses, Implement risk responses and Monitor risks. **Project Procurement management:** Plan procurement management, Conduct procurement, Control procurements. **Bloom's Taxonomy Level:** L_1 – Remembering, L_2 – Understanding. L3-Analyzing	**6hrs**
V	**Project stake holder management:** Identify stake holders, Plan stake holder management, Manage stake holder engagement, and Monitor stake holder engagement. A case study relevant to the domain knowledge of the department is taken up to explain the principles of the project management as brought out above. **Bloom's Taxonomy Level:** L_1 – Remembering, L_2 – Understanding. L3-Analyzing	**5hrs**

Course Outcomes:

Course outcome	Descriptions
CO1	Outline the procedure for analyzing a project and define the rational of work break structure
CO2	Illustrate the use of network techniques for successful project implementation
CO3	Design the procedure for overall financial analysis of the project alongside the resources requirement and ideal quality
CO4	Identify the sources and process for communication, risk management and procurement and build a comprehensive plan for the stakeholder management.

Course Articulation Matrix

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

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Project Management Book of Knowledge	Book of Knowledge	6th Edition, PMI, USA
2	Project Management	Dennis Lock	Taylor & Francis 10th Edition-2013

Reference Books:

Sl No	Reference Books Title	Author	Volume and Year of Edition
1	Project Planning: Analysis, Selection, Implementation and Review,	Prasanna Chandra	MC- Graw Hill Education, 8th Edition, 2017.
2	Project Management-a system approach to planning, scheduling & controlling	Harold Kerzner	CBS publications and Distributions,2002

Question paper pattern: The question paper will have TEN questions. There will be TWO questions from each unit. Each question will have questions covering all the topics under a unit. The students will have to answer FIVE full questions, selecting ONE full question from each unit.

Department: CIVIL ENGINEERING			**Semester:**	**V**
Subject: Dept. Skill Lab-3 Highway Materials Laboratory				
Subject Code:	**22CE507**		**L – T – P - C:**	**1–0–2–2**

Course Objectives:

Sl. No.	This Course will enable the students to
1	Learn to test the strength and suitability of soil for road construction using the California Bearing Ratio (CBR) test.
2	To gain practical experience in creating mix designs for different pavement layers and to design bituminous layers.
3	To develop skills to visually and physically assess pavement conditions, including identifying cracks, measuring road width, and checking for unevenness and potholes.
4	To gain theoretical knowledge and lab skills to real-world situations by conducting pavement evaluations and designing maintenance plans to ensure safe and durable roads.

LAB CONTENT

Sl. No	Experiment Description
	Test on Subgrade soil
1	California Bearing Ratio test
	Mix design of following pavement layers:
2	Granular Sub base
3	WBM Base and BM layer
4	WMM
5	BM
6	Dense Bituminous Macadam
7	Bituminous Concrete
	Marshall stability test
8	Marshall mix design & Determination of OBC
	Pavement Evaluation
9	**Visual evaluation-** observation and identification of crack type, surface condition, width and markings, sign boards.
10	**Physical evaluation-** unevenness and rutting measurement by Straight edge method, road width measurement.
11	Measurement of Pavement thickness, depth of crack and Potholes.
12	Manual method of traffic volume count.

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	**Analyze** subgrade soil using CBR tests to determine its strength.
CO2	**Evaluate** pavement layers through mix design and pavement evaluation methods.
CO3	**Design** bituminous mixes using Marshall stability test to find the optimal binder content (OBC).
CO4	**Apply** visual and physical evaluation methods to assess pavement condition and traffic volume

Course Articulation Matrix

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

Department: Humanities and Sciences			**Semester:**	**5th Semester**
Subject: SKILL DEVELOPMENT-II (APTITUDE SKILLS)				
Subject Code:	**22SK508**		**L – T – P - C:**	**0-0-2-1**

Course Objectives:

Sl. No	This course will enable the students to
1	Develop Critical Thinking and Reasoning Skills
2	Master Seating and Arrangement Techniques
3	Enhance Analytical and Mathematical Reasoning
4	Apply Advanced Problem-Solving Strategies

COURSE TOPICS: The course has 28 lecture hours in 5 Units, 2- lecture hours per week of 1-hour duration.

Unit	Description	Hrs
I	**Logical Aptitude** - Syllogism, Venn-diagram method, Three statement syllogism, Deductive and inductive reasoning. Introduction to puzzle and games organizing information, parts of an argument, common flaws, arguments and assumptions. **Linear Seating Arrangement** Single or Double rows facing each other or away from each other in the same direction **Circular Seating Arrangement** · Uni- & Bi-directional problems on · Circular, Square, Rectangular, Hexagonal tables **Coding Decoding:** Letter Coding, Number Coding, symbol coding **Crypt arithmetic**: Basic concepts , addition , subtraction, multiplication of coded alphabets, Types of cryptarithm, Clocks and Calendar **Reasoning** – a. Verbal - Blood Relation, Sense of Direction, Arithmetic & Alphabet. Non- Verbal reasoning - Visual Sequence, Visual analogy and classification. Analytical Reasoning - Single & Multiple comparisons, Linear Sequencing.	6
II	**Permutation and Combination**: Understanding the difference between the permutation and combination, Rules of Counting-rule of addition, rule of multiplication, factorial function, Concept of step arrangement, Permutation of things when some of them are identical, Concept of 2n, Arrangement in a circle. **Probability**: Single event probability, multi event probability, independent events and dependent events, mutually exclusive events, non-mutually exclusive events, combination method for finding the outcomes.	6
III	**Number System** · Divisibility & Remainder, · Multiples & Factors,· Integers,· LCM & HCF,· Complete a number Series,· Find the Missing Term and Wrong Term **Simplification** · BODMAS Rule, · Approximation, · Decimals, · Fractions, · Surds & Indices	6

	Percentage Calculation-oriented basic percentage, Profit and Loss, Successive Selling type, Discount & MP, Dishonest Dealings, Partnerships Interest : Simple Interest, Compound Interest, Mixed Interest, Instalments. **Data Interpretation**: Approach to interpretation - simple arithmetic, rules for comparing fractions, Calculating (approximation) fractions, short cut ways to find the percentages, Classification of data– Tables, Bar graph, line graph, Cumulative bar graph, Pie graph, Combination of graphs. Combination of table and graphs	
IV	**Averages and Allegations mixtures**: Average: relevance of average, meaning of average, properties of average, deviation method, concept of weighted average. Allegation method: a situation where allegation technique, general representation of allegations, the straight line approach, application of weighted average and allegation method in problems involving mixtures. Application of allegation on situations other than mixtures problems. **Data Sufficiency**: Questions based on > Quantitative aptitude, > Reasoning aptitude > Puzzles	4
V	**Ratio and Proportion** · Simple Ratios, · Compound Ratios, · Comprehend and Dividend · Direct & Indirect Proportions, · Problems on ages,· Mixtures & Allegation **Speed, Time and Distance** · Relative Speed, · Average Speed, · Problems on Train, · Boat & Stream. **Time and Work** · Work Efficiency, · Work & Wages, Pipes & Cisterns	6

Course Outcomes:

Course outcome	At the end of the course students will be able to
CO1	Enhanced Logical and Analytical Thinking
CO2	Proficiency in Advanced Arrangement and Sequencing Problems
CO3	Strong Numerical and Mathematical Aptitude
CO4	Effective Data Interpretation and Quantitative Analysis

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				

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	How to Prepare for Logical Reasoning for CAT" by Arun Sharma	Arun Sharma	• ISBN-10: 9352602280 • ISBN-13: 978-9352602287
2	A Modern Approach to Verbal & Non-Verbal Reasoning" by R.S. Aggarwal	R.S. Aggarwal	• ISBN-10: 8121924987 • ISBN-13: 978-8121924986

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Quantitative Aptitude for Competitive Examinations" by R.S. Aggarwal	R.S. Aggarwal	❑ ISBN-10: 9352534026 ❑ ISBN-13: 978-9352534021
2	Logical Reasoning and Data Interpretation for the CAT" by Nishit K. Sinha	Nishit K. Sinha	❑ ISBN-10: 933922269X ❑ ISBN-13: 978-9339222694

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)

VI SEMESTER B.E.

SI No.	Course Code		Course Title	Teaching dept.	L	T	P	C	CIE	SEE	Total Marks	Exam Hours
01	PC	22CE601	**Transportation Engineering**	**CE**	4	-	-	**3**	50	50	100	3
02	PC	22CE602	**Concrete Technology**	CE	3	-	2	**4**	50	50	100	3
03	PC	22CE603	**Structural Analysis-II**	CE	3	-	2	**4**	50	50	100	3
04	PE	22CE6PE4x	**Professional Elective-II**	CE	4	-	-	**3**	50	50	100	3
05	OE	22CE6OE5x	**Open Elective-II**	CE	3	-	-	**3**	50	50	100	3
06	HS	22xx66x	**Online Course**	HS	2	-	-	**2**	50	--	50	--
07	PW	22CEMP607	**Mini Project**	**CE**	-	-	4	**2**	50	50	100	3
08	HS	22SK608	**Preplacement Training**	T&P	-	-	2	**1**	50	-	50	-
L: Lecture, T-Tutorial, P-Practical/Drawing, CIE: Continuous Internal Evaluation, SEE: Semester End Examination				**Total**	17	**-**	10	**22**	**400**	**300**	750	--

Credits Distribution: Basic Science (BS)=08+08+3+3=22, Electrical Science (ES)=10+11=21, Humanities & Social Sciences (HS)=1+2+2+1+3=09, Program Core (PC)=02+16+16+15+11=58, Program Elective (PE)=03+03=06, Open Elective(OE)=03+03=06, Project work (PW)=02,
Total Credits=20+20+21+21+22+22=126

Professional Elective II:	**Open Elective II:**	**Online Course:**
22CE6PE41: Hydrology and water resources	22CE6OE51: Conservation of Natural resources	22NP661: NPTEL
22CE6PE42:Advanced Transportation Engineering	22CE6OE52: Solid Waste Management	22MC662: MOOC
22CE6PE43:Advanced Geotechnical Engineering	22CE6OE53: Alternative Building Materials	22SW663: SWAYAM

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:**	**VI**
Subject: TRANSPORTATION ENGINEERING				
Subject Code:	**22CE601**		**L – T – P - C:**	**3–0–0–3**

Sl. No	Course Objectives
1	Learn the fundamentals of transportation planning and the history of road development.
2	Understand various cross-sectional elements and the geometrics of highways.
3	Understand the design and evaluation of different types of pavements.
4	Understand highway economics and financing.

Unit	Description	Hrs
I	**Principles of Transportation Engineering**: Importance of Transportation. Different modes of transportation, characteristics and comparison of different modes. Jayakar committee recommendations and implementation- IRC, CRRI, CRF. **Highway Development and Planning:** Road Types and classification, urban road classification, Road patterns, Planning surveys, 3rd road development plan- problems, Master plan - saturation system of road planning-problems on priority.	**7**
II	**Highway Alignment and Surveys**: Ideal alignment, factors affecting alignment, engineering surveys for new and realignment projects. **Cross Sectional Elements**: Importance, Factors controlling the design of geometric elements- highway cross sectional elements, pavement surface characteristics, camber, super elevation, width of carriageway, shoulder width, right of way, extra widening, typical cross section of roads in rural, urban, cutting and embankment. Simple problems on Camber, Super elevation and extra widening. (no derivation)	**9**
III	**Highway Geometric Design**: Sight distances–SSD, OSD, ISD, HSD, Factors affecting sight distances. Horizontal alignment- horizontal curves, Design of super elevation, radius of curve, extra widening. Vertical alignment- Highway gradients, summit and valley curves, Design of length of curve only. Transition curves- objectives, types and its suitability. Problems on Sight distances, Super elevation, extra widening, radius of curve, length of vertical curves (no derivation)	**9**
IV	**Pavement Design**: Pavement types, component parts of flexible and rigid pavements and their functions, difference between flexible and rigid pavements, ESWL concept and Graphical method problems only. Design of flexible pavement as per IRC: 37-2001. Stresses in rigid pavement and problems.	**9**
V	**Pavement Evaluation:** Unevenness measurement by straight edge method, Bump integrator and Merlin, Deflection measurement by Benkelman beam method and simple problem on BBD. **Highway Economics:** Highway user benefits – Quantifiable & Non-Quantifiable benefits, Concept of VOC, Highway costs – Annual highway cost .Economic analysis by annual cost method and benefit cost ratio method. Numerical problems on above.	**5**

Course Outcomes:

Course outcome	Descriptions
	After studying this course students will be able to
CO1	**Analyze** highway alignment, geometric design, and pavement types for proper design.
CO2	**Evaluate** transportation modes and highway planning based on IRC and Jayakar committee guidelines.
CO3	**Design** flexible and rigid pavements using IRC standards and geometric principles.
CO4	**Apply** highway economics and pavement evaluation methods in cost and safety analysis.

Course Articulation Matrix

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

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	S K Khanna and C E G Justo	Highway Engineering	2018
2	L R Kadiyali	Highway Engineering	2019

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	MoRT&H Specifications for Roads and Bridges	---	5th Edition, 2001
2	K.P.Subramanium	Transportation Engineering I	2016
3	R Srinivasa Kumar	Highway Engineering	2015

Department: Civil Engineering		**Semester:**	**VI**
Subject: Concrete Technology			
Subject Code:	**22CE602**	**L – T – P - C:**	**3-0-2-4**

Course Objectives:

Sl. No.	This Course will enable the students to
1	Outline the manufacturing and types of cements and concrete and its application.
2	Assess the methods of measuring properties of concrete
3	Describe various strength of concretes and enhancing the properties of concrete using admixtures
4	Analyse the methods of mix proportion and importance of special concrete

Unit	Description	Hrs.
I	**Concrete Ingredients:** Cement – Cement manufacturing by Dry Process, Chemical composition and their importance, hydration of cement, types of cement. Testing of cement – Field test, Normal Consistency, Initial setting time, Final setting time and Soundness. Fine aggregate - Functions, Coarse aggregate - Importance of size, shape and texture. Qualities of water.	8
II	**Fresh Concrete:** Workability, Factors affecting workability, Measurement by various tests, Manufacturing o f Concrete: Mixing, Transporting, Placing, Compaction and Curing, Importance of Curing and Methods of Curing, Segregation, Bleeding.	8
III	**Hardened concrete:** Factors influencing strength, W/C ratio, gel/space ratio, Maturity concept, Testing of hardened concrete – Compressive strength test, Split tensile test, Flexural Strength test, Creep –factors affecting creep. Shrinkage of concrete – plastic Shrinking and drying shrinkage, Factors affecting shrinkage.	8
IV	**Admixtures:** Chemical admixtures–plasticizers, accelerators, retarders and air Entraining agents. Mineral admixtures – Pozzolonic and cementitious materials, Fly Ash, GGBS, silica fumes, Metakaolin and rice husk ash. **Durability**- Definition, significance, permeability, sulphate attack, chloride attack, carbonation, freezing and thawing.	8
V	**Mix design:** Introduction, variables in proportioning exposure conditions, Procedure of mix design as per IS 10262-2009. Numerical examples of mix design. . **Special Concrete:** Properties and applications on High Strength concrete, High Performance Concrete, Self-Compacting Concrete, Fibre Reinforced Concrete and Geo-polymer Concrete.	7

Lab Content

Sl. No	Experiment Description	Hrs
1	**Test on Fresh Concrete** Slump Cone Test Compaction Factor Test Vee-bee Consist meter Test	13
2	**Test on Hardened Concrete** Compression Strength Test Split Tensile Strength Test Flexural Strength Test	

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	List types of cement and their applications.
CO2	Describe the composition, properties of concrete, and the role of admixtures. Explain factors affecting concrete durability.
CO3	Utilize testing methods to evaluate fresh and hardened concrete.
CO4	Assess concrete mix designs according to IS code. Propose specialized concrete formulations for specific needs.

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	Concrete Technology	Neville A M	Volume 1,2nd Edition,2019
2	Concrete Technology	Gambhir M L	Volume 1,5th Edition,2017

Reference Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Concrete Technology	M S Shetty	8th edition, published in 2019
2	Concrete Technology	Shanthakumar.A.R	Apr 2018, Oxford University Press, New Delhi, ISBN-13: 978-0199458523
3	Elements of Strength of Materials	D.H.Young, S.P.Timoshenko	East West Press Pvt. Ltd., 5th Edition

Department: Civil Engineering		**Semester:**	**VI**
Subject: STRUCTURAL ANALYSIS – II			
Subject Code:	**22CE603**	**L – T – P - C:**	**3-0-0-3**

Course Objectives:

Sl. No.	This Course will enable the students to
1	This course will enable students to apply knowledge of mathematics and engineering in analyzing indeterminate beams.
2	This course will enable students to identify and solve problems on structurally indeterminate beams, arches and frames.
3	This course will enable students to use the techniques, such as moment distribution method and Kani's method to solve engineering problems
4	This course will enable students to use the software's to analyze the beams, arches, and frames.

Unit	Description	Hrs.
I	**Indeterminate beams:** Consistent deformation method, Analysis of propped Cantilever and fixed beams.	**8**
II	**Slope deflection method:** Analysis of Continuous beams with different end conditions & sinking of supports. Analysis of orthogonal frames without sway. Analysis of orthogonal frames with sway.	**7**
III	**Two hinged arches:** Determination of Horizontal thrust in hinged arch. Bending moment, normal thrust and radial shear in the arch (Parabolic and circular).	**7**
IV	**Moment Distribution Method:** Introduction, Distribution factor and distribution of moment, Analysis of continuous beams and frames. Analysis of orthogonal frames without sway. Analysis of orthogonal frames with sway.	**9**
V	**Kani's method**: Introduction, Rotation factor and Kani's cycles, Analysis of continuous beams and frames. Analysis of orthogonal frames without sway. Displacement factor and Kani's cycles.	**9**

Experiments:

1	Analyze a Single-story building.
2	Analyze a Multi-story building.

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	Analyze indeterminate beams.
CO2	Analyze structurally indeterminate beams, arches and frames.
CO3	Analyze the indeterminate structures to moment distribution method and Kani's method to solve engineering problems.
CO4	Analyze the analyze the beams, arches, and frames by using softwares.

Course Articulation Matrix:

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

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Structural Analysis II	S.S. Bhavikatti	Vikas Publishers,
2	" Basic structural Analysis"	C.S Reddy	Tata McGraw-Hill

Reference Book:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Structural Analysis	L S Negi and R S Jangid	Tata McGraw- Hill
2	Indeterminate Structural Analysis	J.Sterling Kinney	Oxford and IBH Publishing Co

Department: Civil Engineering		**Semester:**	**6th**
Subject: Hydrology and Water Resources			
Subject Code:	**22CE6PE41**	**L – T – P - C:**	**3-0-0-3**

Course Objectives:

Sl. No.	This Course will enable the students to
1	Make the students understand the principles of Hydrologic Cycle and precipitation.
2	Make the students understand the principles rain gauges and estimation of rainfall methods.
3	Make the students understand about evapotranspiration and infiltration.
4	Make the students understand about hydrographs and irrigation engineering.

Unit	Description	Hrs.
I	**Introduction & Precipitation**: Introduction, Hydrologic cycle (Horton's representation). Water budget equation Precipitation: introduction, forms of precipitation, types of precipitation, measurement of precipitation (Simon's gauge & Syphon gauge only), Hyetograph and mass curve of rainfall, Selection of rain gauge station.	8
II	**Components of Hydrological cycle**: Adequacy of rain gauges, methods of computing average rainfall, interpolation of missing data. Evaporation: Definition, factors affecting, measurement (Class A pan). Estimation using empirical methods (Meyer's and Rohwer's equation), evaporation control.	8
III	**Evapotranspiration and Infiltration**: Evapotranspiration: Definition, factors affecting, measurement, estimation (Blaney-Criddle method). Infiltration: Definition, factors affecting, measurement (double ring infiltrometer), Horton's equation of infiltration.	7
IV	**Hydrographs and conveyance:** Definition, components of hydrographs, unit hydrograph and its derivation from simple storm hydrograph, base flow separation, Prepositions of UNIT hydrograph- problems (S curve method excluded). Definition of flood, factors affecting flood, methods of estimation. Infiltration indices (φ and W Index). Canals: Definition, Types of canals, Alignment of canals.	7
V	**Irrigation Engineering, Water Requirement of Crops and Canal:** Introduction Optimum Moisture Content, soil-moisture, Irrigation requirements or relationships, Irrigation efficiencies & frequency of irrigation -Problems. Water requirement of a crop, duty, delta, base period. Design of canals by Kennedy's and Lacey's Methods-Problems.	9

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	Define and analyze and apply the basic principles of precipitation, evaporation and Infiltration, estimate runoff. And Hydrographs.
CO2	Estimate flood using various techniques.
CO3	Derive hydrographs and unit hydrographs.
CO4	Use the concepts of irrigation engineering and canal design interpret data and analyze it.

Course Articulation Matrix:

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

Text Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Engineering hydrology	K. Subramanya	Tata McGraw-Hill Company 5th Edition
2	Irrigation and Water Power Engineering	B C Punmia and PandeLal	Laxmi Publication Limited, NewDelhi. 2019 Edition

Reference Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Flow in Open Channels	K. Subramanya	TataMcGraw- HillCompany 3rd Edition
2	Design of minor irrigation and Canal structures	C. Sathya Narayana Murthy	3rd Edition, 2009

Department: CIVIL ENGINEERING			**Semester:**	**VI**
Subject: RAILWAYS AND AIRPORT ENGINEERING				
Subject Code:	**22CE6PE42**		**L – T – P - C:**	**3– 0–0–3**

Course Objectives:

Sl. No.	This Course will enable the students to
1	Understand the history and development, role of railways, railway planning and development based on essential criteria's
2	Understand the railway alignment and geometrics of railway.
3	Learn different types of structural components, engineering properties of materials, to calculate the material quantities required for construction
4	Design and plan airport layout, design facilities required for runway, taxiway and impart knowledge about visual aids

Unit	Description	Hrs
I	**Railway Planning**: Significance of Road, Rail, Air and Water transports – Coordination of all modes to achieve sustainability – Elements of permanent way – Rails, Sleepers, Ballast, rail fixtures and fastenings, – Track Stress, coning of wheels, creep in rails, defects in rails	**8**
II	**Railway Alignment**: Route alignment surveys, conventional and modern methods- – Soil suitability analysis – Geometric design of railways, gradient, super elevation, widening of gauge on curves- Points and Crossings (Explanation & Sketches of Right- and Left-hand turnouts only).	**8**
III	**Railway Construction and Maintenance**: Earthwork – Stabilization of track on poor soil, Calculation of Materials required for track laying – Construction and maintenance of tracks – Modern methods of construct ion & maintenance – Railway stations and yards and passenger amenities- Urban rail – Infrastructure for Metro, Mono and underground railways.	**8**
IV	**Airport Planning**: Air transport characteristics, airport classification, airport planning: objectives, components, layout characteristics, and socio-economic characteristics of the catchment area, criteria for airport site selection and ICAO stipulations, typical airport layouts, Parking and circulation area	**8**
V	**Airport Design**: Runway Design: Orientation, Wind Rose Diagram, Runway length, Problems on basic and Actual Length, Geometric design of runways, Configuration and Pavement Design Principles, Elements of Taxiway Design, Airport Zones, Passenger Facilities and Services, Runway and Taxiway Markings and lighting.	**7**

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	Acquires the knowledge of railway planning, materials.
CO2	Acquires capability of choosing alignment and also design geometric aspects of railway system
CO3	Suggest and estimate the material quantity required for laying a railway track and also will be able to determine the hauling capacity of a locomotive
CO4	Develop layout plan of airport and will be able relate the gained knowledge to identify required type of visual and/or navigational aids for the same

Course Articulation Matrix

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

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	"Railway Engineering"	Saxena and Arora	DhanpatRai and Sons, New Delhi
2	Airport Planning and Design	Khanna, Arora and Jain	NemchandRoorkee.

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	"Railway Engineering"	Satish Chandra and Agarwal, M.M	Oxford University Press, New Delhi
2	"Indian railway Track"	Agarwal M.M	Jaico Publications, Bombay

Department: Civil Engineering		**Semester:**	**VI**
Subject: Advanced Geotechnical Engineering			
Subject Code:	**22CE6PE43**	**L – T – P - C:**	**3-0-0-3**

Course Objectives:

Sl. No.	This Course will enable the students to
1	Learn introductory concepts of Geotechnical investigations required for civil engineering projects emphasizing in-situ investigations.
2	Understand the concept of drainage in soils and to compute the lateral earth pressure acting on retaining structures.
3	Study the aspects of settlement of footings in different types of soils and to study the methods of stability analysis of slopes.
4	Conceptually learn the theory of flow nets in earthen dams bearing capacity of shallow foundations and different methods of ground improvement.

Unit	Description	Hrs.
I	**Subsurface Exploration:** Introduction to soil exploration, objectives, methods, boring methods-auger, wash & rotary drilling, soundness tests-standard penetration test and cone penetration test, geophysical methods-seismic refraction and electrical resistivity. Numerical Problems on above. Stabilization of bore holes, guidelines for spacing, location and depth of bore holes, Sampling and its types-undisturbed, disturbed and representative, types of samplers, factors affecting sampling. Numerical problems on sampling.	8
II	**Drainage and dewatering:** Introduction, location of ground water table in fine and coarse grained soils. Methods of dewatering-sumps, ditches, well point, vacuum, preloading and electro-osmosis. **Lateral earth pressure:** Introduction to earth pressure, active, passive earth pressures and earth pressure at rest. Rankine's theory of earth pressure, assumptions and limitations. Numerical problems on lateral earth pressure in cohesive and frictional backfills.	8

III	**Settlement of foundation:** Introduction to settlement, types of settlement-immediate, consolidation and secondary settlements, modes of settlement-uniform, differential and tilt. Numerical problems on computation of settlement in cohesive and cohesionless soils. **Stability of slopes:** Introduction to slopes, types of slopes, causes for failure of slopes, stability of slopes by method of slices and Taylor's stability number. Numerical problems on above.	8
IV	**Flow nets:** Introduction, basic equation for seepage, flow nets and its characteristics, methods of obtaining flow nets, seepage through earthen dams with and without filter. Numerical problems on above. **Ground improvement:** Introduction, objectives, selection of best soil. Modification-vibrofloation and stabilization by lime, fly ash and cement. Grouting and its types.	7
V	**Bearing capacity:** Introduction to bearing capacity, definitions of ultimate, net and safe bearing capacities and allowable bearing pressure. Terzaghi's bearing capacity theory and assumptions. Types of failures of shallow foundations. Numerical problems on bearing capacity of footings resting on cohesive and cohesionless soils.	8

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	Prepare the report of sub surface exploration to assess the properties of sub-soil and to adopt the suitable method of dewatering for the safe design of foundations.
CO2	Design the retaining structures based on the lateral earth pressure and to predict the settlement of footings subjected to different loadings.
CO3	Analyze the slopes by suitable methods for different ground conditions and to make the choice of suitable method of ground improvement for practically associated problems.
CO4	Construct the phreatic line for an earthen dam to calculate the seepage discharge and to ascertain the bearing capacity of footings resting on different types of soils.

Course Articulation Matrix:

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

Text Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	"Basic and Applied Soil mechanics", New Age Publishers and Distributors, New Delhi.	Gopal Ranjan and A S R Rao	2nd Edition, 2009
2	"Geotechnical Engineering", New Age Publications, New Delhi	Venkatramaiah C	3rd Edition, 2009

Reference Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	"Soil Mechanics And Foundation Engineering", UBS Publishers And Distributors, New Delhi.	V N S Murthy	2nd Edition, 2009
2	"Soil Mechanics Fundamentals", John Wiley And Sons Publications, New York.	Muni Budhu and Wiley Blackwell	2nd Edition, 2009

Department: Civil Engineering		**Semester:**	**6**
Subject: CONSERVATION OF NATURAL RESOURCES			
Subject Code: 22CE6OE51		**L – T – P - C:**	**3-0-0-3**

Course Objectives:

Sl. No	This course will enable the students to
1	Learn about conservation and availability of water resources, soil conservation and sustainable land use planning.
2	To know about conservation of soil and sustainable land use planning and To Know the atmospheric composition of air, pollution and effects
3	Know about conservation of energy, biodiversity and rural ecosystem
4	Know about EIA and disaster management in conservation of natural resources

Unit	Description	Hrs
I	**Water:** Global and Indian water resources, Surface and sub surface resources need for environmental management of water resources. Seasonal & perennial rivers, Interlinking of rivers (case study) , **Rivers** – Himalayan component, peninsular component, River water quality monitoring. **Ground water**: recharge of ground water. Contamination of ground water and its control, recycle and reuse of wastewater, Rain water harvesting (advantages)	8
II	Land: Land as a resource, types of lands, conservation of land forms, deforestation, effect of land use changes. Soil health, ecological and economic importance of soil, impact of soil degradation on agriculture, need for soil conservation, Soil erosion, conservation of forest, wildlife and its benefits. Mineral resources of india and its availability	8
III	**Air:** Introduction, composition, sources and classification of air pollutants, National Ambient Air quality standards (NAAQS), Air quality index, effects of air pollution on human health and plants. Control of air pollution **Energy:** types, alternative sources and its conservation **Biodiversity:** Introduction, Flora and Fauna, Importance of biodiversity, Economic values-medicinal plants **Conservation of biodiversity:** National parks, wild life sanctuaries, zoological gardens, gene banks, pollen culture, ecological restoration, social forestry.	8
IV	EIA: Regulations in India, status of EIA in India, list of projects needing environmental clearance under EIA notifications ,Urban and Rural Ecosystems - Land use pattern and Landscape, Zoning regulation for different land users and externalities caused by mixed land uses, Special Economic Zone (SEZ), Coastal Regulation Zone (CRZ), Urban green belt concept – Biological species for Carbon Sequestration, Importance of lung space	7

V	**DISASTER MANAGEMENT:** Definition, Natural and Manmade Disasters Economic Damage, Loss of Human and Animal Life, Destruction of Ecosystem, Disaster Preparedness and Management Preparedness: Monitoring of Phenomena Triggering a Disaster or Hazard; Evaluation of Risk: Application of Remote Sensing, Data from Meteorological and Other Agencies, Media Reports: Governmental and Community Preparedness. Post-Disaster Diseases and Epidemics	8

Course Outcomes:

Course outcome	At the end of the course students will be able to
CO1	Know the importance of water resources and its conservation
CO2	Apprehend various components of land as a natural resource and land use planning.
CO3	Analyze the components of Air, energy and biodiversity as resource and its conservation
CO4	Know about biodiversity & its role in functioning of ecosystem, EIA and disaster management

Course Articulation Matrix

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

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	"Fundamentals of Ecology"	Odum, E.P	W.B sounders, Philadelphia, USA, 1971
2	An advanced textbook of Biodiversity- Principle &Practices	Krishnamurthy K.V.	Oxford and IBH publications, New Delhi. 2004

Reference Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Disaster Management in India: Perspectives,issues and strategies.	Nishith, R. and Singh, A.K	New Royal book Company, jan 2021
2	Environmental impact assessment methodologies	Y Anjaneyulu and valli manickam	B S publications 2010

Department: Civil Engineering		**Semester:**	**6**
Subject: Solid Waste Management			
Subject Code: 22CE6OE52		**L – T – P - C:**	**3-0-0-3**

Course Objectives:

Sl. No	This course will enable the students to
1	Know methods of solid waste management system and to analyze their draw backs comparing with statutory rules
2	Understand different elements of solid waste management from generation of solid waste to disposal
3	Analyze different processing technologies and to study conversion of municipal solid waste to compost or biogas
4	Evaluate landfill site and to study the sanitary landfill reactions and management of bio medical, e waste and hazardous waste, recycle and reuse concepts

Unit	Description	Hrs
I	**Introduction:** Definition, importance of solid waste management, functional elements of solid waste management. Sources: Sources of Solid waste, Types of solid waste, Physical and Chemical composition of municipal solid waste. Generation rate- Numerical Problems., Collection: Collection of solid waste, type of waste collection system, Storage and handling. Transportation: Need of transfer operation, transfer station and types, transport means and methods, route optimization.	8
II	**Processing techniques:** Purpose of processing, Volume reduction by incineration, Process description, Mechanical volume reduction (compaction), Mechanical size reduction (shredding), component separation (manual and mechanical methods). garbage chutes **Incineration:** Process 3 T's, factors affecting incineration process, pyrolysis, waste minimization 4Rs.	7
III	**Composting Aerobic and anaerobic method** - process description, factors affecting composting, Indore and Bangalore processes- design consideration, Mechanical composting, Vermi composting, fermentation **Sanitary land filling:** Definition, advantages and disadvantages, site selection, reaction occurring in landfill- Gas and Leachate movement, collection & Control of gas and leachate movement, Design of sanitary landfill. Numerical Problems. geosynthetic liners in sanitary landfills.	8
IV	**Disposal Methods:** Sources, collection, storage, treatment and disposal of Biomedical waste, E-waste, Hazardous waste and management rules and regulations. Solid waste management 2000 rules with, 2016 amendments	8
V	**Recycle and Reuse:** Material and energy recovery operations, power generation, plastic wastes, Best management practices, public private partnership, role of government and NGO in SWM, ground water monitoring, ground and surface water pollution by solid waste	8

Course Outcomes:

Course outcome	At the end of the course students will be able to
CO1	Know the importance of SWM and its guidelines
CO2	Get the knowledge of sources, collection and transport & process techniques of SWM
CO3	Know disposal of Bio medical waste, e waste, hazardous waste and composting methods
CO4	Understand the importance of recycle and reuse and public responsibilities in SWM

Course Articulation Matrix

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

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Integrated Solid Waste Management	George Tchobanoglous, Hilary Theisen , Samuel A Vigil	Engineering principles and management issues", M/c Graw hill Education . Indian edition 1999
2	Environmental Engineering	Howard S Peavy, Donald R Rowe and George Tchobanoglous	Tata Mcgraw Hill Publishing Co ltd. 2012

Reference Books:

Sl No	Study materials for reference
1	Municipal Solid Wastes (Management and Handling) Rules, 2000.Ministry of Environment and Forests Notification, New Delhi, the 25th September, 2000. Amendment – 1357(E) – 08-04-2016
2	Municipal Solid waste management manual, Part II published under Swachh Bharat Mission, Central Public Health and Environmental Engineering Organization (CPHEEO), 2016, Ministry of Urban Development, Government of India. CPCB guidelines for Bio medical waste, e waste, hazardous waste disposal and management rules 2016

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:**	**VI**
Subject: Alternative Building Materials			
Subject Code:	**22CE6OE53**	**L – T – P - C:**	**3-0-0-3**

Course Objectives:

Sl. No.	This Course will enable the students to
1	Understand environmental issues due to building materials and the energy consumption in manufacturing building
2	Gain the knowledge of bylaws for the planning of a public/private building.
3	Study the various masonry blocks, masonry mortar and structural behavior of masonry under compression.
4	Understand the alternative building technologies which are followed in present construction field.

Unit	Description	Hrs.
I	**Introduction:** Energy in building materials, Environmental issues concerned to building materials, Global warming and construction industry, Environmental friendly and cost effective building technologies, Requirements for building of different climatic regions, Traditional building methods and vernacular architecture	
II	**Building Planning and Maintenance:** plan, section and elevation. Introduction, classification of buildings, components of buildings, building By-Laws, orientation of buildings, ventilation, acoustic requirements, Super structure: introduction, brick masonry, stone masonry and R.C.C. Building maintenance Deterioration of concrete, deterioration of masonry works, prevention of cracks and leaks, cost effective construction.	
III	**Alternative Building Materials:** Characteristics of building blocks for walls, Stones and Laterite blocks and hollow clay blocks, Concrete blocks, Stabilized mud blocks, Steam cured blocks, Fal-G Blocks stone masonry block. Lime- pozzolana cements: Raw materials, Manufacturing process, Properties and uses, Fibre reinforced cement composite: Matrix materials, reinforcing materials : metallic, polymeric, mineral and natural fibers, Properties and applications.	
IV	**Alternate Building Technologies:** alternatives for wall constructions, composite masonry, confined masonry, cavity walls, rammed earth, Ferro cement and ferroconcrete building components, Materials and specifications, Properties, Construction methods, Applications. Top down construction, Mivan Construction Technique.	
V	**Equipment for Production of Alternate Materials**: Machines for manufacture of concrete, Equipment's for production of stabilized blocks, Moulds and methods of production of precast elements, Cost concepts in buildings, Cost saving techniques in planning, design and construction, Cost analysis: Case studies using alternatives.	

Course Outcomes:

Course Outcomes	At the end of the course students will be able to
CO1	Solve the problems of Environmental issues concerned to building materials and cost effective building technologies;
CO2	Develop plan, section and apply bylaws and investigate causes and remedies for cracks, have an insight to cost effective construction.
CO3	Analyse different alternative building materials which will be suitable for specific climate and in an environmentally sustainable manner.
CO4	Apply various types of alternative building materials and technologies and design a energy efficient building by considering local climatic condition and building material.

Course Articulation Matrix:

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

Text Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	"Alternative Building Materials and Technologies"	KS Jagadish, B V Venkatarama Reddy and K NanjundaRao,	New Age International pub.
2	"Structural Masonry"	Arnold W Hendry,	Macmillan Publishers.

Reference Books:

Sl. No.	Text Book Title	Author	Volume & Year of Edition
1	Building Materials in Developing Countries	RJS Spence and DJ Cook,	Wiley pub.
2	Green Building Rating System	LEED India	IGBC pub.
3	Green Homes Rating System,	IGBC	CII pub.

Department: Civil Engineering **Semester: VI**

Subject Name: Mini Project

Subject Code: 22CEMP607 **L-T-P-C: 2-0-0-2**

Course Objectives

Sl No	Description
1	The students will be able to understand the practical applications of surveying.
2	The students will get practical training in construction of a layout planning along with water supply and sanitary project.
3	The students will get practical knowledge of survey work for water supply, sanitary and highway project.
4	This course will provide students to prepare capacity contour map, canal alignment and provision of sluice cum waste weir in construction of a new tank.

1. **Water supply and sanitary project for new layout planning:**
   The work shall consist of:
   a. Reconnaissance survey for selection for water supply & Sanitation. Examination of sources of water supply and location of sites for overhead reservoir including population forecasting.
   b. Design of Sewage treatment plant, elevated reservoir, filter, sedimentation tank.
   c. Design of main water supply and preparation of drawing and report.
2. **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 (minimum 0.5 to 1 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.
   c. Conduction of CBR test of subgrade for design of flexible pavement with drainage including relevant drawings.
   d. Geometric design of vertical and horizontal curves and highway elements like super-elevation, camber etc.

e. Drawing shall include key plan initial alignment, final alignment, longitudinal section along final alignment, typical cross sections of road.

3. New tank project:

The work shall consist of:

a. Reconnaissance survey for selection of site and conceptualization of project.

b. Alignment of center line of the proposed bund, longitudinal and cross sections of the center 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. Earthwork calculation, Construction of phreatic line of earthen dam and calculation of seepage discharge.

e. Design of earthen dam, sluice, weir with apron, canal and other relevant components.

f. Design and preparation of drawing with report.

Course Outcomes

COs	Description
CO1	This course will enable students to apply the task environment for various projects and working in team towards goals, to enhance technical and behavioral competence.
CO2	This course will enable students to propose a water supply & sanitary lines for new layout.
CO3	This course will enable students to design the various components to align a new highway project.
CO4	This course will enable students design an earthen dam, construction phreatic line for the same including design of canal, suitable sluice and waste weir for the bund.

Department: Humanities and Sciences		**Semester:**	**6th Semester**
Subject: Pre-placement Training (Software for Civil Engineering)			
Subject Code:	**22SK608-CE**	**L – T – P - C:**	**0-0-2-1**

Sl. No	This course will enable the students to
1	The leap into three dimensions requires many changes in thinking and drawing habits for those who are used to 2D drawing.
2	This course introduces to the concepts and methods of 3D modelling in Autodesk Revit Architecture also gives a
3	To pick up skill in the accompanying parts of E-Tabs like Modelling, Concrete Frame Design and Detailing, Steel Frame Design and Detailing.
4	To train on Steel Connection Design, Composite Beam and to make Dynamic Analysis

Course Objectives:

COURSE TOPICS: The course has 30 lecture hours in 5 days. 6- Lecture hours per day

Unit	Description	Hrs
I	**Introduction to Autodesk Revit Architecture:** Starting an Architectural Project : Starting a New Architectural Project, Navigation Tools, Configuring Global Settings **Creating Architectural Walls** Starting an Architectural Project : Starting a New Architectural Project, Navigation,Tools, Configuring Global Settings, Creating Architectural Walls, **Using Basic Building Components - I** : Adding Doors, Adding Windows and Wall Openings **Using the Editing Tools :** Working with SelectionSets, Editing Tools I & II , Grouping Elements, Retrieving Information About Elements **Working with Datum Planes and Creating Standard Views :** Working with Levels,Working with Grids, Working with Reference Planes and Work Planes, Controlling, the Display of Elements. **Working with Project Views** **Using Basic Building Components – II** : Creating Floors, Roofs & Ceilings, Shape, Editing Tools, Adding Rooms **Using Basic Building Components – III :** Working with Components, Adding Stairs, Adding Railings and Ramps, Creating Curtain Walls	7

II	**Adding Site Features** : Working With Site Features, Property Lines and Building, Pads, Adding Site Components, Using Massing Tools, Understanding Massing, Concepts, Creating Massing, Geometry in the Family Editor, Editing Massing, Geometry in the Family Editor, Massing in the Conceptual Design Environment, Creating Massing Geometry in a Project, Creating Building Elements from Massing Geometry, Creating Families. **Adding Annotations and Dimensions** Adding Tags, Room Tags, Keynotes, Adding Symbols and Dimensions, Dimensioning Terminology and Dimensioning Tools, Adding Alternate Dimension Units and Spot Dimensions. **Creating Project Details and Schedules** Project Detailing in Autodesk Revit Architecture, Crop Regions, Fills Patterns,and Detail Components, Adding Text Notes, Creating Drafting Views, RevisionClouds, Working with Schedules **Creating Drawing Sheets, and Plotting** Creating Drawing Sheets, Creating Duplicate Dependent Views, Printing in Revit Architecture **Creating 3DViews:**Three Dimensional (3D)Views, Dynamically Viewing Models with Navigation Tools, Orienting a 3DView, Generating Perspective Views, Using a SectionBox	7
III	**Rendering Views and Creating Walkthroughs** Rendering in RevitArchitecture, Working with Materials, Lights, Decals and Entourage, Rendering Settings, Creating a Walkthrough Autodesk 360 ,Rendering **Using Advanced Features** Creating Structural Components, Generating Multiple Design Options, Using Area AnalysisTools, Masking Regions, Creating Displaced Views, Color Schemes, Working with Project Phasing Tools, Work-sharing Concepts, Elements Families, Browsers, Generating Shadows, Creating Solar Studies, Working with Point Clouds, Revit Architecture Interoperability, Linking Building.	6
IV	**Introduction to ETABS:** Features and Capabilities, - User Interface and Navigation, - Basic Concepts in Structural Modelling - Defining Material Properties, -Defining Section Properties (Beams, Columns, Slabs) **Modelling Structural Elements:** -Drawing Beams, Columns, and Slabs, -Defining Loads and Load Combinations	5
V	**Design of Structural Elements:** Design of Concrete Structures, Design of Steel Structures **Detailed Modelling and Design of a Multi-Story Building** **MX road software:** Introduction to Mx road software**,** User Interface and tools, Data input total station points. **Alignment and modelling:** fixing alignment line, Drawing of geometric elements,3D modelling. **Pavement Design:** Input material specification, Design and Analysis	5

Course Outcomes:

Co1	The leap into three dimensions requires many changes in thinking and drawing habits for those who are used to 2D drawing.
CO2	This course introduces to the concepts and methods of 3D modelling in Autodesk Revit Architecture also gives a thorough grounding in 3D fundamentals and explores the main features of Autodesk Revit's 3D environment.
CO3	Will have the capacity to perceive story levels and have the capacity to information building information in a coherent and simple way and will make stand out model of the floor frameworks and the vertical and sidelong surrounding frameworks to have the capacity to break down and outline the whole building.
CO4	Can keep the outline information and configuration licensed innovation in illustrations, plain shape or sends it to a printer or fare it to a database document or even spare it as an ASCII record and oversee them in a sheltered, incorporated spot.

Course Articulation Matrix

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

Text Books:

Sl No	Text Book title	Author	Volume and Year of Edition
1	Autodesk Revit for Architecture Certified User Exam Preparation (Revit 2025 Edition)	Daniel John Stine AIA, IES, CSI, CDT, Well AP	Available January 22, 2025 By Intermediate
2	Etab V18 Black book	Gaurav Verma	Cadcamcae Works, 27 Feb 2020 - Architecture

Reference Books:

Sl No	Reference Book title	Author	Volume and Year of Edition
1	Residential Design Using Autodesk Revit 2025	By Daniel John Stine AIA, IES, CSI, CDT, Well AP	Published June 21, 2024 Beginner
2	Autodesk Revit 2025 BIM Management	By ASCENT	Available November 12, 2024 ,Intermediate