



**Government of Karnataka
Department of Technical Education**

Diploma in Civil Engineering

C-25 Scheme of Studies (Effect from the AY 2025-26)



Government of Karnataka
DEPARTMENT OF TECHNICAL EDUCATION

Curriculum Structure

III Semester Scheme of Studies

Sl. No.	Teaching Department	Course Code	Course Name	Hours per week			Total Contact Hours/week	Credits	CIE Marks		Theory SEE Marks		Practice SEE Marks		Total Marks
				L	T	P			Max	Min	Max	Min	Max	Min	
Integrated Courses															
1	CE	25CE31I	Advanced Surveying	4	0	4	8	6	50	20	50	20	-	-	100
2	CE	25CE32I	Construction Techniques	4	0	4	8	6	50	20	50	20	-	-	100
3	CE	25CE33I	Engineering Mechanic and Strength of Materials	3	0	4	7	5	50	20	-	-	50	20	100
4	CE	25CE34I	Building Planning & Drawing	3	0	4	7	5	50	20	-	-	50	20	100
Audit Course															
5	KAN	25KA31T	Kannada -I (ಸಾಹಿತ್ಯ ಸಿಂಚನ-1/ಬಳಕೆ ಕನ್ನಡ-1)	2	0	0	2	2	50	20	-	-	-	-	50
Total				16	0	16	32	24	250	-	100	-	100	-	450



Government of Karnataka
DEPARTMENT OF TECHNICAL EDUCATION

Program	CIVIL ENGINEERING	Semester	III
Course Name	ADVANCED SURVEYING	Type of Course	Integrated
Course Code	25CE31I	Contact Hours	104 Hrs./Sem. 8 Hrs./Week
Teaching Scheme	L:P :: 4:4	Credits	6
CIE Marks	50	SEE Marks	50 (Theory)

1. Rationale:

The rationale for including advanced surveying as a subject in education lies in its critical role in shaping the world we live in. With technological advancements and increased reliance on spatial data, advanced surveying has become essential in many professional fields. By integrating traditional surveying principles with new technologies, the subject provides students with the skills and knowledge needed to adapt to the evolving demands of the industry, ensuring they contribute to a more precise, efficient, and sustainable future.

2. Course Outcomes: At the end of the Course, the student will be able to:

CO-01	Effectively use a theodolite for angular measurement, traverse surveying ensuring students to develop both theoretical knowledge and practical skills in the use of theodolites for accurate surveying.
CO-02	Effectively use theodolites to measure vertical angles and horizontal distances to determine the elevation differences between points.
CO-03	Gaining hands-on experience with total station equipment and understand its theoretical foundations and applications in various surveying and engineering contexts.
CO-04	Understanding of remote sensing and GPS technologies, their applications, and how to use them effectively in real-world situations.
CO-05	Understand the basics of Drone Technology and GIS

3. Course Content

WEEK	CO	PO	Theory	Practice
1	1	1,4,7	1.Component parts of transit theodolite and their functions. 2. Reading the Vernier, Salient features and relationship between the fundamental axis of transit theodolite. 3 & 4. Technical terms used, Temporary adjustments, errors in Theodolite surveying.	1. Conduct temporary adjustments of transit theodolite. Practice reading the Vernier of circular scales in transit theodolite.
2	1	1,2,4,6,7	1. Theodolite traversing. Open and Closed Traverse, traversing by direct observation of angles. 2. Theodolite traversing by deflection angle method. 3 & 4. Checks for closed traverse, Calculation of bearing from angles.	2. Measure horizontal angle between the given points by repetition method. 3. Measure horizontal angle between the given points by reiteration method.
			1. Traverse computation - Latitude, Departure, closing error.	4. Conducting a Closed traverse of a given area and balancing it by

3	1	1,2,4,6,7	2.Numerical problems on Computing latitude and departure 3 & 4. Consecutive coordinates and independent coordinates.	a. Bowditch rule b. Transit rule
4	1,2	1,2,4,6,7	Balancing the traverse – Bowditch method, Transit method.	5.Measure vertical angle between the given points.
5	2	1,2,4,6,7	1.Trigonometrical Survey and its applications. 2.Elevations and Distances of accessible points whose base is Accessible. 3 & 4. Base is accessible Single Plane Method-Simple problems.	6. Measure height of an object whose base is accessible. 7. Determination of height of an object whose base is inaccessible (single plane method instrument axes at different levels – case 1 IHT at A>B)
6	2	1,2,4,6,7	1 & 2. Elevations and Distances of inaccessible points whose base is inaccessible. 3 & 4. Base is inaccessible, Single plane method Simple problems.	8.Determination of height of an object whose base is inaccessible (single plane method instrument axes at different levels –case 2 IHT at B>A)
7	3	1,4,6,7	1. Total Station: Introduction, Integral parts, Applications. 2. Advantages, Disadvantages. Fundamental measurements. 3 & 4. Coordinate calculations from fundamental measurements.	9. Study the basic operations in total station. 10. Conduct 3 point closed traverse in coordinate system using total station and find the error.
8	3	1,4,6,7	1.Total station setting up – Occupied point, Back sight, Fore sight, P code, Instrument Height (IH), Reflector height (RH). 2.Change point - Procedure for re orientation in total station during traverse surveying. 3.Data transfer from total station to computer, transmission software, file types. 4. Stake out – Procedure, Resection – Procedure.	11. Conduct topographic survey of a given area using total station and plot topographic, contour maps in open source software like SWDTM & CAD.
9	3,4	1,4,6,7	1.Remote sensing - Basic components of remote sensing, Remote sensing process, electromagnetic spectrum regions. 2.Energy interaction with earth surface. Types of remote sensing, sensor systems, remote sensing platforms. 3.Data acquisition and data interpretation. Applications of remote sensing in civil engineering. 4. GPS - Introduction, Segments of GPS	12.Find out the height of a remote point like tip of a transmission tower or chimney using Total Station. (i) With Reflector. (ii) Without reflector. 13. Stake out using Total Station – Mark the given coordinate on the field.
10	3,4	1,4,6,7	1.Principle of position determination using GPS. 2.Application of GPS, Errors in GPS. 3 & 4. Differential GPS- Introduction, Principle of DGPS/GNSS, Working with DGPS/GNSS.	14. Resection using total station – Find the missing coordinate of the occupied/station point on field from two known coordinate points.
11	4	1,4,6,7	1. GNSS constellations. Components of GNSS-Receiver (base and rover).	15.Record co-ordinates of any given point in field using hand held GPS and

			2.Types of survey – Post processing survey and real time kinematic survey (RTK). 3. Accuracy and precision, Applications of GNSS-Topo survey, Road stake, Surface stake. CAD stake. 4. Latest trends and Future in India.	transfer to google earth through KML file.
12	5	1,4,6,7	1.GIS – Main elements of GIS, component subsystems of GIS. 2.Spatial data, attribute data. Applications of GIS. 3.Introduction to open source GIS like QGIS, Overview of the software, Installation. 4.Preparation of base map.	16. Prepare topographic survey map of given area using DGPS.
13	5	1,4,6,7	1. Aerial Surveying - Type of aerial Survey-Introduction to UAV survey. 2&3. Merits & demerits of UAV (drones) survey, Types of drones used in construction industry. 4.Utilizing drone technology in civil engineering field.	17. Prepare base plan using open sources GIS software like QGIS

4. References:

- 1 Duggal, S. K., Surveying Vol. I & II, Tata Mcgraw Hill, New Delhi
- 2 Subramanian, R., Surveying & Levelling, Oxford University Press, New Delhi
- 3 Punamia, B.C., Surveying Vol. I, II & III, Laxmi Publications
- 4 Kanetkar, T.P. and Kulkarni, S.V., Surveying and Levelling Vol. I & II, Pune Vidyarthi Gruh
- 5 Arora, K.R., Surveying Vol. I, II & III, Standard Book House. New Delhi
- 6 Basak, N.N., Surveying and Levelling, Tata Mcgraw Hill, New Delhi
- 7 A.Bannister, S. Raymond, R. Baker, "Surveying", Pearson, 7th ed., NewDelhi
- 8 Agor, R., Surveying and Levelling, Khanna Publishers, New Delhi
- 9 Agor, R. Advanced Surveying, Khanna Publishers, New Delhi
10. <https://www.earthpoint.us/ExcelToKml.aspx>
- 11<https://www.advancednavigation.com/tech-articles/global-navigation-satellite-system-gnss-and-satellite-navigation-explained/>

5. CIE Assessment Methodologies

Sl. No	CIE Assessment	Test Week	Duration (minutes)	Max marks	Average of all CIE=50 Marks
1.	CIE-1TheoryTest	4	90	50	
2.	CIE-2Practice Test	7	180	50	
3	CIE-3TheoryTest	10	90	50	
4.	CIE-4Practice Test	13	180	50	
5	CIE-5 Portfolio evaluation of all the activities through Rubrics	1-13		50	
Total					50 Marks

6. SEE – Theory Assessment Methodologies

Sl. No	SEE – Theory Assessment	Duration	Exam Paper Max marks	Exam Paper Max Marks scale down to (Conversion)	Min marks to pass
1.	Semester End Examination-Theory	3 Hours	100	50	20

7. CIE Theory Test model question paper

Program		Civil Engineering			Semester -III	
Course Name		Advanced Surveying			Test	I/III
Course Code		25CE31I	Duration	90 min	Marks	50
Name of the Course Coordinator:						
Note: Answer any one full question from each section. Each full question carries equal marks.						
Q.No	Questions			Cognitive Level	Course Outcome	Marks
Section – 1						
1	a)			U/R	1/2,3	5
	b)					10
	c)					10
2	a)			U/R	1/2,3	5
	b)					10
	c)					10
SECTION - 2						
3	a)			U/Ap/An	1/3,4	5
	b)					10
	c)					10
4	a)			U/Ap/An	1/3,4	5
	b)					10
	c)					10
Note for the Course coordinator: Each question may have one, two or three subdivisions. Optional questions in each section carry the same weightage of marks, cognitive level and course outcomes.						

Signature of the Course Coordinator Signature of the HOD Signature of the IQAC Chairman

7. CIE Practice Test 1 model question paper

Program	Civil Engineering			Semester	III
Course Name	Advanced Surveying			Test	II
Course Code	25CE31I	Duration	180 min	Marks	50
Name of the Course Coordinator:					
Questions				CO	Marks
1. Conduction of any one exercise on theodolite survey / trigonometric levelling / Total station.				1, 2, 3	45
Scheme of assessment Experiment 1. a) Procedure & Tabulation = 15 b) Setting & Conduction = 20 c) Observation and result = 10 Total marks = 45					
2. Viva-voce					05
					50

Signature of the Course Coordinator

Signature of the HOD

7. CIE Practice Test 2 model question paper

Program	Civil Engineering			Semester	III
Course Name	Advanced Surveying			Test	IV
Course Code	25CE31I	Duration	180 min	Marks	50
Name of the Course Coordinator:					
Questions				CO	Marks
1. Conduction of any one exercise Total station. (30 marks)				3	45
2. Conduction of anyone exercise on GPS/DGPS/QGIS. (15 marks)				4, 5	
Scheme of assessment Experiment 1. a) Procedure & Tabulation = 5 b) Setting & Conduction = 15 c)Observation and result = 10 Total marks = 30		Experiment 2. a) Procedure & Tabulation = 5 b) Setting & Conduction = 5 c)Observation and result = 5 Total marks = 15			
3. Viva -voce					05
Total Marks					50

Signature of the Course Coordinator

Signature of the HOD

8. Suggestive Activities:

The List is an Example and not inclusive of all possible activities of the course. Student and Faculty are encouraged to choose activities that are relevant to the topic (Atleast one activity for each Course Outcome)

Sl. No.	Suggestive Activities
01	Setting out footing marking using total station
02	Fix the boundary points of college campus using total station
03	Prepare a report on Continuously Operating Reference Stations (CORS) in Karnataka
04	Prepare a map of Government Polytechnics in Karnataka using QGIS importing base map data from

	K-GIS
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9. Rubrics for Assessment of Activity (Qualitative Assessment)

Sl. No.	Dimension	Beginner	Intermediate	Good	Advanced	Expert	StudentsS core
		10	20	30	40	50	
1		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	20
2		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	30
3		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	40
4		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	50
Average Marks=(20+30+40+50)/4=35							35

Note: Dimension and Descriptor shall be defined by the respective course coordinator as per the activities

10. Equipment/software list with Specification for a batch of 30 students

Sl.No.	Particulars	Specification	Quantity
01	Tape	Fiberglass tape	8
02	Ranging rods	Circular/ Octagonal Ranging rods preferably circular with 3 to 5 cm dia made up of either seasoned solid bamboo sticks or metal conduit pipe of length 2 to 3 meters, with conical metallic shoe fitted at bottom & fully painted with 20 cm. long colour bands of either of the following combination	30
03	Vernier transit Theodolite	Angle Measurement Accuracy 20 secs, Display Panel Single Side, Magnification 30x, Measuring Time 30 Sec, Field of View 2.6 m at 100 meters	8
04	Total station with prism	Magnification 24x, Field of View 1-30-inch, Minimum Focusing Distance 1.5 Meter, Single Prism Distance Measurement 4.0 Km, Accuracy 3mm +2ppm	4
05	DGPS Receiver (Base & Rover)	GNSS Receiver	2
06	Drone	Surveying purpose	1
07	Hand held GPS	screen Size 3.5 Inch, Type Wireless, Usage Land Survey, Width 69 mm, Depth 30 mm	1
08	Computers	All in One Desktop Set: Intel i5 3470, 8GB, 500GB HDD, 19 inches HD Monitor, Keyboard, Mouse, HD Webcam, Mic, Speakers, WiFi, Display Port, Windows 10 Pro, MS Office	10



Government of Karnataka
DEPARTMENT OF TECHNICAL EDUCATION

Program	CIVIL ENGINEERING	Semester	III
Course Name	CONSTRUCTION TECHNIQUES	Type of Course	Integrated
Course Code	25CE32I	Contact Hours	104 Hrs./Sem. 8 Hrs./Week
Teaching Scheme	L : P :: 4 : 4	Credits	6
CIE Marks	50	SEE Marks	50 (Theory)

1. Rationale: Civil engineering is the oldest discipline of Engineering. Since the very beginning of human existence, it has been an aspect of life. Construction is an important sector of civil engineering that contributes greatly in the economic growth of a nation. Construction techniques in civil engineering are crucial for ensuring the efficient, safe, and sustainable development of infrastructure. These techniques provide systematic methods for executing construction projects, enabling the transformation of design concepts into functional structures. It is expected that the students should know the basics of the same to apply it in the field. Through this course student will develop the desired skills and competencies which are expected from them for construction related works.

2. Course Outcomes: At the end of the Course, the student will be able to:

CO-01	Identify basic construction tools, type of soil, soil improvement techniques, test it to confirm properties and strength, recommend suitable excavation methods and type of foundations.
CO-02	Identify different type of masonry and list various structural components to be built, classifications and suitability of pre stressed pre-cast members
CO-03	Select a suitable type of surface works, list the various work and recommend the appropriate construction techniques and services to be used for a required building structure.
CO-04	Identify various interior and furnishing works, utility services and provide recommendations to adopt the same in the structure.

3. Course Content

WEEK	CO	PO	Theory	Practice
1	1	1,2,4	1. Physical properties of soil: Porosity, Density, Specific Gravity, Saturation, Moisture Content and Void Ratio 2. Classification of soils based on particle size distribution, classification of soil based on Indian Standard Soil Classification System, and their suitability for the construction of different structures. 3. Bearing capacity of soil, Safe bearing capacity of soil. Determination of Bearing capacity by Standard penetration test (SPT). 4. Determination of Bearing capacity by plate load test. SBC Values for various types of Soils.	1. Identification and explanation of construction tools: Spirit level, Plumb Bob, Trowel, Shovel, Tube level etc. 2. Identify the type of soil based on visualization and validate the type of soil by conducting sieve analysis test - Particle size distribution using semi-log graph. 3. Tests on Moisture content of soil (Oven drying method)
2	1	2,4,7	1. Site/ground clearance, Excavation for foundation – a.	4. Test on soil:

			General excavation, b. Deep excavation. 2. Soil improvement techniques - Compaction Piles, Geotextiles, Cement Soil Mixing, Dynamic compaction. 3. Soil nailing – Advantages. 4. Dewatering – Necessity, Methods of dewatering of foundations.	a) Liquid limit b) Plastic limit c) Shrinkage limit.
3	1	1,2,4,7	1. Foundation: Purpose of foundation, classification of foundation - Shallow foundation: Isolated footing, spread footing, combined footing, Strap footing and Raft foundation. 2. Foundation in Black Cotton Soil: Causes for failure of foundation and preventive measures. 3. & 4. Deep foundation: Pile foundation – classification, Necessity of pile foundation. Suitability of foundation for different types of structure	5. Field density of soil by core cutter.
4	2	2,4,7	1. Stone masonry- terms used - Facing, Backing, hearting, through stone, Corner stone, Cornice. Types of stone masonry - Rubble stone masonry, Ashlar stone masonry 2. Brick masonry: Terms used in brick Masonry-Header, stretcher, closer, quoins, course, face, back, hearting, bat, bond, joints, lap, frog, in line, level and plumb. 3. Bonds in brick masonry - English bond (one brick thick), & Flemish Bond (one brick thick), header bond, stretcher bond. 4. Concrete Block masonry – types, advantages. Autoclaved aerated concrete block masonry – advantages & disadvantages.	6. Conduct Standard Proctor test on soil compaction.
5	2	1,2,3,7	1. Lintels: definition, types of lintels based on method, shape, and materials. 2. & 3. Doors and windows - classification based on materials, classification based on working operation. 4. Chejja, canopy, portico, and balcony – Purpose of providing in buildings. Classification based on materials.	7. Construct one brick thick masonry in English Bond. 8. Construct stretcher bond masonry wall.
6	2	1,2,3,7	1.. Staircase: Definition, terms used in stairs, types of stairs based on shapes. Components of dog legged staircase, Ramps – definition, purpose. 2. Flat Reinforced cement concrete roof - slab with beam, flat slab, flat plate. 3. Pitched roof – Advantages, components of king post truss. 4. Pre stressed concrete slab - construction, advantages, Suitability, comparison, Pre cast members	9. Construct one brick thick masonry in Flemish Bond. 10. Construct one brick thick pier
7	3	1,3	1. Scaffolding: Necessity, component parts, process of erection and dismantling of steel scaffolding. Shoring: Purpose. 2. Form work: Purpose, types of form work - plastic formwork, plywood framework, fabric formwork, steel framework, and timber Formwork. Requirements of good formwork 3. Process of formwork for slab concreting, Panel floor formwork, climbing formwork system, Table formwork system 4. De-shuttering - De-shuttering time for columns, slabs,	11. Test on brick - Dimensionality tolerance test. 12. Compression test on brick/concrete block 13. Water absorption test of bricks

			beams. Factors affecting the de-shuttering time, and Precautions during de-shuttering.	
8	3	2,3,7	1. Plastering: Necessity of plastering, Tools used in plastering, Cement plastering - construction methodology for internal wall plastering, ceiling plastering, external wall plastering, 2. Gypsum plastering - materials, Construction methodology, advantages. Pebble dash plastering - materials, construction methodology, advantages. 3. Curing: Objective of curing, Duration of water curing for different surfaces - slab concrete, plastered surface, column concrete masonry surface and others. 4. Curing compounds for concrete applications - properties, process of application, uses.	14. Geometrical design of a dog legged staircase.
9	3	1,2,5,7	1. Flooring, Factors affecting the selection of suitable type of floors. 2. Construction methodology - Cement concrete floorings. Vitrified tile flooring, epoxy flooring. 3. Construction methodology - Granite flooring, Wooden flooring, Vinyl flooring, Vacuum dewatered flooring. 4. Wall Cladding - Definition, advantages, construction methodology.	15. Prepare a checklist and process manual for Cement Plastering and Gypsum Plastering.
10	3	1,2,4,7	1. Painting: Purpose of painting, methodology of painting new surfaces on internal and external walls for high rise buildings. 2. Defects in painting, Whitewashing and Color Washing - definition Purpose.. 3. Roof slab leakages or dampness and arresting it. Pressure and injection grouting - necessity, materials, methodology. 4. Water proofing: Necessity and importance, materials, methods used for Reinforced cement concrete terrace slab water proofing, bathroom.	16. Prepare a checklist and process manual for Internal wall Painting and External wall Painting.
11	4	1,2,5,7	1.& 2. Building façade - Toughen glass work, Aluminum work, Aluminum Composite panel. 3 & 4. False ceiling- necessity, types, construction methodology - Plaster of Paris ceilings, Gypsum ceilings.	17. Transfer of levels using tube level. 18. Erection of doors and windows using spirit level and plumb bob.
12	4	1,2,5,7	1 & 2. Monolithic concrete construction using aluminum or composite formwork - materials, construction methodology, 3 & 4 Mivan formwork system.	19. Demonstrate Mivan formwork system through videos .
13	4	2,3,5,7	1 & 2. Heating, Ventilation and Air Conditioning. - Importance & Components of HVAC system. 3. & 4. 3D-Printing technology in Construction - Introduction , Benefits , Applications	20. Demonstration of 3D-Printing In Construction.

4. References:

- B C Punmia, "Building Construction", Laxmi Publications
- Building construction by Rangwala :Charotar publications"
- Building construction by Sushil kumar : " standard publishers distributors"
- Bureau of Indian Standards, "HandBook of Functional Requirements of Buildings, (Sp-41 &Sp- 32)", BIS 1987 and 1989.

- e. <https://3dprintingindustry.com/news/it-and-iit-madras-develop-indias-first-3d-printed-post-office-in-just-43-days-224284/>

5. CIE Assessment Methodologies

Sl.No	CIE Assessment	Test Week	Duration (minutes)	Max marks	Average of all CIE=50 Marks
1.	CIE-1TheoryTest	4	90	50	
2.	CIE-2Practice Test	7	180	50	
3	CIE-3TheoryTest	10	90	50	
4.	CIE-4Practice Test	13	180	50	
5	CIE-5 Portfolio evaluation of all the activities through Rubrics	1-13		50	
Total					50 Marks

6. SEE - Theory Assessment Methodologies

Sl. No	SEE – Theory Assessment	Duration	Exam Paper Max marks	Exam Paper Max Marks scale down to (Conversion)	Min marks to pass
1.	Semester End Examination-Theory	3 Hours	100	50	20

7. CIE Theory Test model question paper

Program	Civil Engineering			Semester - III	
Course Name	Construction techniques			Test	I
Course Code	25CE32I	Duration	90 min	Marks	50
Name of the Course Coordinator:					
Note: Answer any one full question from each section. Each full question carries equal marks.					
Q.No	Questions		Cognitive Level	Course Outcome	Marks
Section - 1					
1	a) Explain soil classification based on particle size (5 m) b) List five necessities of dewatering. Explain any one method of dewatering (10 m) c) Explain any five properties of soil (10m)		R/U R/U R/U	CO 1	25
2	a) Determination of Bearing capacity by plate load test. (15 m) b) Explain soil improvement technique by compaction piles (10m)		R/U	CO 1	
Section - 2					
3	a) List any five necessity of pile foundation(5m) b) Explain soil improvement technique by cement soil mixing		R/U R/U	CO 1 CO1	25

	(10 m) c) With a neat sketch explain 1 brick thick English bond(10m)		CO2	
4	a) Write advantages of soil nailing(5m) b) With a neat sketch explain (i) Raft footing (ii) combined footing(10m) c) List advantages of (i) autoclaved aerated concrete block (ii) concrete block masonry. (10 m)	R/U R/U R/U	CO 1 CO1 CO2	
Note for the Course coordinator: Each question may have one, two or three subdivisions. Optional questions in each section carry the same weightage of marks, cognitive level and course outcomes.				

Signature of the Course Coordinator Signature of the HOD Signature of the IQAC Chairman

7. CIE Practice Test model question paper

A. Fill in the blank Test model question paper					
Program	Civil Engineering			Semester	III
Course Name	Construction Techniques			Test	II
Course Code	25CE32I	Duration	180 min	Marks	50
Name of the Course Coordinator:					
Questions				CO	Marks
1. Tests on soil:Identify the type of soil based on visualization and validate the type of soil by conducting sieve analysis test - Particle size distribution using semi-log graph / Tests on Moisture content of soil (Oven drying method) / Test for Atterberg Limits / Field density of soil by core cutter / Conduct Standard Proctor test on soil compaction.				1,2,3	50
2. Tests on bricks: Dimensionality tolerance test / Compression test on brick/concrete block / Water absorption test of bricks.					
Scheme of assessment					
a) Tests on soil - 20 Procedure – 05 Conduction – 10 Results – 05					
b) Tests on Bricks – 20 Procedure – 05 Conduction – 10 Results – 05					
c) Viva - 10					
Total Marks					50

Signature of the Course Coordinator

Signature of the HOD

7. CIE Practice Test model question paper

7. End Practice Test model question paper					
Program	Civil Engineering			Semester	III
Course Name	Construction Techniques			Test	IV
Course Code	25CE32I	Duration	180 min	Marks	50
Name of the Course Coordinator:					
Questions				CO	Marks
1. Geometrical design of a dog legged staircase				1,2,3	40
2. Tests on Masonry: Construct 1 brick thick masonry in English Bond / Construct 1 ½ brick thick masonry in English Bond / Construct 1 brick thick masonry in Flemish Bond / Construct 1 ½ brick thick masonry in Flemish Bond.					
3. Checklist and process manual: Prepare a checklist and process manual for - Cement Plastering / Gypsum Plastering / Internal wall Painting / External wall					

Painting		
Scheme of assessment a) Geometrical Design - 10 b) Tests on Masonry – 20 Procedure – 10 Conduction – 10 c) Process manual and Checklist - 10		
Viva		10
Total Marks		50

Signature of the Course Coordinator

Signature of the HOD

8. Suggestive Activities:

The List is an Example and not inclusive of all possible activities of the course. Student and Faculty are encouraged to choose activities that are relevant to the topic (Atleast one activity for each Course Outcome)

Sl. No.	Suggestive Activities
01	Study and prepare a report on anti-termite treatment in buildings
02	Study the construction methodology of basement and Retaining wall.
03	Study & prepare a report on various precast partition panels.
04	Study the suitability of elevators and escalators in different type of buildings.

9. Rubrics for Assessment of Activity (Qualitative Assessment)

Sl. No.	Dimension	Beginner	Intermediate	Good	Advanced	Expert	Student Score
		10	20	30	40	50	
1		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	40
2		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	30
3		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	50
4		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	10
Average Marks= (40+30+50+10)/4 = 32.5							32.5

Note: Dimension and descriptor shall be defined by the respective course coordinator as per the activities

10. Equipment/software list with Specification for a batch of 30 students

Sl No	Particulars	Specification	Quantity
1	IS Sieve 20 mm 10 mm 4.75 mm, 2.00 mm, 1.18 mm, 600 µm, 425 µm, 300 µm, 212 µm, 150 µm, 75 µm, Pan.	IS sieve for soil testing	3 set
2	Measuring Jars of 1000, 500, 100, 10ml	Plastic measuring JAR	3 set

3	Digital weighing Balance 12 kg capacity with minimum 1 gm. accuracy.	0.5gm accuracy	2 no
4	Hot air Oven	Stainless Steel Member Lab Oven	1no
5	Core cutter with dolly	Soil Testing Machine	3 set
6	Standard proctor compaction apparatus	Cylindrical Metal Mold, having internal diameter 4" or 6", the internal height of 4.6" and the mold should have detachable base plate& collar of 2 inches (5.08 cm), Rammer, weighing 5.5 lbs (2.5 kg) & having fall of 12 inches (30.5cm), with a flat circular face of 2"diameter.	1set
7	Atterberg limits apparatus	Soil testing apparatus	5 set
8	Portable core drilling machine	350mm core cutting machine	1set
9	Pick Axe	For digging soil	10 no
10	Spirit level	1mtr length	10 no
11	Trowel	Small	10 no
12	Oil can	250ml (for pouring water)	5 no
13	Right angle 1*1.5m	1*1.5m	10 no
14	Measuring tape	metal tape 3mtr	5 no
15	Safety goggle	Engineer's safety goggle	10 no
16	Wheelbarrow	Small	1no
17	Portable Air blower	Hand blower type power 600w	1no
18	CTM	Material: Mild Steel, Display Type: Digital, Motor Power: 1 hp, Voltage: 220 V, Capacity: 2000KN, Automation Grade: Semi-Automatic, Frequency: 50 Hz, Least Count: 1 N, Motor: 1HP, Power Supply: 440 VOLTS.	1no



**Government of Karnataka
DEPARTMENT OF TECHNICAL EDUCATION**

Program	CIVIL ENGINEERING	Semester	III
Course Name	ENGINEERING MECHANICS AND STRENGTH OF MATERIALS	Type of Course	Integrated
Course Code	25CE33I	Contact Hours	91 Hrs./Sem. 7 Hrs./Week
Teaching Scheme	L: P:: 3:4	Credits	5
CIE Marks	50	SEE Marks	50 (Practice)

1. Rationale:

The study of strength of materials often refers to various methods of calculating the stresses and strains in structural members such as beams, columns and shafts. The methods employed to predict the response of a structure under loading and its susceptibility to various failure modes takes into account the properties of the materials such as its yield strength, ultimate strength, Young's modulus, and Poisson's ratio. In addition, the mechanical elements, geometric properties such as its length, width, thickness, boundary constraints and abrupt changes in geometry such as holes are considered.

2. Course Outcomes: At the end of the Course, the student will be able to:

CO-01	Explain the potential impact of forces / stresses on structural elements / materials in a given condition.
CO-02	Calculate the Moment of Inertia for given symmetrical or asymmetrical geometric sections validate using CAD software.
CO-03	Calculate shear force and bending moments for different loading conditions and support conditions, draw the SFD & BMD and validate using analysis software.
CO-04	Calculate bending, shear stresses and slope deflection in beams under different load conditions and validate the analysis using any open-source software.
CO-05	Calculate and validate the safety of a column for various given loads and end conditions.

3. Course Content

WEEK	CO	PO	Theory 3 hours/week (per batch)	Practice 4 hours/ week (2 hours/ batch twice in week)
1	1	1,2,3, 4,7.	1. Force and characteristics of a force. Force system: Classification of force system according to plane and line of action- Principle of transmissibility of forces, moment of a force, Resolution & composition of forces.	1 & 2 Verification of Lami's Theorem.
			2. Resultant force, Law of moments, Resultant of Concurrent and non-concurrent force system. Equilibrium conditions.	

			3. Simple Problems on determination of resultant of concurrent & non concurrent force systems.	
2	1	1,2,3,4,7.	1. Rigid body, plastic body Mechanical properties of metal- Rigidity, Elasticity, Plasticity.	1. Hardness test to evaluate a hardness of given material Example: Mild Steel, cast iron, Brass and Aluminium.
			2. Compressibility, Hardness, Toughness, Stiffness, Brittleness, Ductility	
			3. Malleability, Creep, Fatigue, tenacity, durability. Importance of each property of materials.	2. Impact test to evaluate toughness of a given material Example: Mild Steel and cast iron (Izod and Charpy)
3	1	1,2,3,4,7.	1. Stress, strain, Hooke's law Types of stresses – Normal stress and Shear stress Types of normal stress – Tensile stress and Compressive stress	1&2. Conduct tensile test on following materials and plot Stress-strain curve. a) Mild steel b) TMT / HYSD bar Determine Young's modulus, yield stress/ proof stress, Ultimate stress, breaking stress, percentage of elongation and percentage of reduction in area.
			2. Types of strains- Normal strain and Shear strain Types of normal strain - Longitudinal strain, Lateral strain and volumetric strain Types of Lateral strain – Tensile strain and Compressive strain	
			3. Problems	
4	1	1,2,3,4,7.	1. Elongation and Contraction - Poisson's Ratio and Modulus of Elasticity.	1&2. Collect and discuss the stress strain curve of different Civil Engineering building material and Modulus of Elasticity.
			2. Problems	
			3. Problems	
5	1	1,2,3,4,7.	1. Stresses in bars of composite section (Modular ratio).	1. Problems on axially loaded composite sections.
			2. Principles of superposition, Deformation of uniform bars and bars of varying cross section subjected to constant load.	
			3. Volumetric strain & change in volume, Relation among elastic constants, Thermal stresses.	2. Analysis of Composite Section - Interpretation of Results. (Analysis by any analysis software)
6	2	1,2,3,4,7.	1. Centre of gravity & centroid, Moment of Inertia for Plane lamina: radius of gyration, parallel and perpendicular axes theorems.	1. Calculation of Centroid of different sections using CAD software.
			2. Moment of Inertia for rectangle, square, circle, semi- circle, and quarter circle and triangle section.	2. Determine the centroid and moment of inertia (w.r.t. Centroidal axes) of I-section and Channel section by manual method and validate using CADD software.
			3. M.I of symmetrical and unsymmetrical I-section, Channel section.	
7	2	1,2,3,4,7.	1. MI of T- section, L- section about Centroidal axes and any other reference axis. (Problems)	1. Determine the centroid and moment of inertia (w.r.t. Centroidal axes) of T - section and L -section by manual method and validate using CADD software.
			2. MI of hollow sections about Centroidal axes and any other reference axis. (Problems)	

			3. MI of built-up sections about Centroidal axes and any other reference axis. Problems	2. Finding the centroid and moment of inertia (w.r.t. Centroidal axes) of built-up sections (I section with cover plates) by CADD software. Comparison of MI with manual calculation and CADD software.
8	3	1,2,3,4,7.	1. Types of beams –Simply Supported, Cantilever, Fixed, Continuous and Overhanging beams. Types of supports: Roller support, Hinged support, Fixed support and Pinned support.	1. Calculation of Bending Moment and shear force for simply supported beams with UDL and point load.
			2. Determinate structures: Types of loading- Axial load, Transverse load, Point load, uniformly distributed load, uniform varying load, moment, support reactions for determinate structures.	2. Analyse simply supported beams, subjected to different types of loads (Point load & UDL) for SFD and BMD using any open-source analysis software.
			3. Concept of shear force and bending moment, sign convention. Relation between bending moment, shear force and rate of loading.	
9	3	1,2,3,4,7.	1. Calculation of Bending Moment and shear force for cantilever beams with UDL and point load and Draw Shear force and bending moment diagrams.	1&2. Analyse cantilever beams, subjected to different types of loads (Point load & UDL), for SFD and BMD using any open-source analysis software.
			2. Problems.	
			3. Problems.	
10	3	1,2,3,4,7.	1. Calculation of Bending Moment and shear force for overhanging beams with UDL and point load Draw Shear force and bending moment diagrams for overhanging beams with UDL and point load and Locate points of contra- flexure.	1&2. Analyse overhanging beams, subjected to different types of loads (Point load & UDL), for SFD and BMD using any open-source analysis software.
			2. Problems.	
			3. Problems.	
11	4	1,2,3,4,7.	1. Bending stress in beam, Assumptions in simple bending theory, bending equations.	1&2. Flexure Test on materials like steel & wood specimens - Two Point Load system. Determine Young's modulus, bending stress and flexural rigidity.
			2. Neutral axis, Modulus of rupture, section modulus, flexural rigidity, moment of resistance.	
			3. Bending and Shear Stresses across the cross section of the beams- rectangular and T section.	
12	4	1,2,3,4,7.	1. Slope and deflection using Moment area method for simply supported and cantilever beams subjected to point loads and UDL.	1&2. Calculation and analysis of beams for slope and deflection by Open-Source analysis software.
			2. Problems.	
			3. Problems.	

13	5	1,2,3,4,7.	1. Introduction - Short and long columns - Euler's theory	1&2. Calculation and analysis of crippling load by Open-Source analysis software for Axial load, eccentric load and column with different materials
			2. Effective length, slenderness ratio - radius of gyration, buckling load, crippling load.	
			3. Assumptions, Euler's Buckling load for different end conditions, Limitations of Euler's theory.	

NOTE 1: The course content shall be delivered through lectures, PowerPoint presentations, video demonstrations and field visits.

NOTE 2: The Activity criteria shall be conducted / executed by the student and to be submitted in portfolio evaluation of activities through rubrics to the faculty.

NOTE 3: The PRACTICE (Performance criteria) shall be conducted by the student and observations and report to be submitted at the end of each session to the faculty.

4. References:

- Ramamurtham. S., "*Strength of Materials*", Dhanpat Rai Publications
- S.S. Bhavikatti & K.G. Rajashekarappa., "*Engineering Mechanics*", New Age International (p) Limited, Publishers.
- S.S. Bhavikatti., "*Strength of Materials*", Vikas Publishing House PVT LTD.
- P N Chandramouli., "*Fundamentals of strength of materials*", PHI New Delhi.
- Relevant IS Codes
- <https://www.thestructuralengineer.info/software/linpro-275>
- <https://app.clearcalcs.com/freetools/free-moment-of-inertia-calculator/au>
- <https://skyciv.com/free-moment-of-inertia-calculator/>
- <https://app.clearcalcs.com/freetools/beam-analysis/au>

5. CIE Assessment Methodologies

Sl.No	CIE Assessment	Test Week	Duration (minutes)	Max marks	
1.	CIE-1TheoryTest	4	90	50	Average of all CIE=50 Marks
2.	CIE-2Practice Test	7	180	50	
3	CIE-3TheoryTest	10	90	50	
4.	CIE-4Practice Test	13	180	50	
5	CIE-5 Portfolio evaluation of all the activities through Rubrics	1-13		50	
Total					50 Marks

6.SEE – Practice Assessment Methodologies

Sl.No	SEE – Practice Assessment	Duration (minutes)	Max marks	Min marks to pass
1.	Semester End Examination-Practice	180	50	20

7. CIE Theory Test model question paper (CIE I/III)

Program		Civil Engineering		Semester -III	
Course Name		Engineering Mechanics and Strength of Materials		Test	I/III
Course Code		25CE33I	Duration	90 min	Marks
					50
Name of the Course Coordinator:					
Note: Answer any one full question from each section. Each full question carries equal marks.					
Q.No	Questions		Cognitive Level	Course Outcome	Marks
Section - 1					
1	a) b) c)		R/U/Ap /An	1/2	25
2	a) b) c)		R/U/Ap /An	1/2	
Section - 2					
3	a) b) c)		R/U/Ap /An	1/3	25
4	a) b) c)		R/U/Ap/An	1/3	
Note for the Course coordinator: Each question may have one, two or three subdivisions. Optional questions in each section carry the same weightage of marks, cognitive level and course outcomes.					

Signature
Course Coordinator

Signature
Programme Coordinator

Signature
IQAC Chairman

7. CIE Practice Test model question paper (CIE 2)

Program		Civil Engineering			Semester	III
Course Name		Engineering Mechanics and Strength of Materials			Test	II
Course Code		25CE33I	Duration	180 min	Marks	50
Name of the Course Coordinator:						
Sl. No	Questions				CO	Marks
1	One Question on forces and its validation with Lami’s theorem				1	10
2	One Experimental Question to Conduct Hardness test/Tensile test/Impact test for a given specimen. Writing Observations and Tabular column, Equation with all notation-10 Conduction of Experiment-5 marks Calculation and result with graph-5 marks				1	20
3	Manual Calculation of Centroid and Moment of Inertia of given section and validate using CADD (10 + 5) marks				2	15
4	Viva- voce					5
Total Marks						50

Signature of the Course Coordinator

Signature of the HOD

7. CIE Practice Test model question paper (CIE 4)

Program		Civil Engineering			Semester	III
Course Name		Engineering Mechanics and Strength of Materials			Test	II/IV
Course Code		25CE33I	Duration	180 min	Marks	50
Name of the Course Coordinator:						
Sl.No	Questions				CO	Marks
1	Manual Calculation of Shear force and Bending moment - 10 marks Draw SFD & BMD for Simply supported beam / cantilever beam / overhanging beam with point load and UDL - 5 marks Validation with any analysis software- 5 marks				3	20
2	One Experimental Question on UTM to Conduct a flexural test for a given specimen Writing Observations and Tabular column, Equation with all notation-5 marks Conduction of Experiment-5 marks Calculation and result -5 marks				4	15
3	One question on slope deflection of beams/ column analysis and its validation with any analysis software (5 + 5) marks				4 or 5	10
4	Viva- voce					05
Total Marks						50

Signature of the Course Coordinator

Signature of the HOD

8. Suggestive Activities:

The List is an Example and not inclusive of all possible activities of the course. Student and Faculty are encouraged to choose activities that are relevant to the topic (Atleast one activity for each Course Outcome)

Sl. No.	Suggestive Activities
1	For any 10 different materials identify their mechanical properties and uses. Prepare note on it and submit with neat Pictures.
2	Calculate the CG and MI of different sections using open-source online tools.
3	Visit the nearby ongoing construction work. Identify the different types of beams and their supports in building. Prepare note on it with photographs.
4	Calculate the deflection for different beams using any open-source online tools.
5	Prove that the column with Fixed supports will take more load as compared with different end conditions.

9. Rubrics for Assessment of Activity (Qualitative Assessment)

Sl. No.	Dimension	Beginner 10	Intermediate 20	Good 30	Advanced 40	Expert 50	Students Score
1		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	20
2		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	40
3		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	30
4		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	50
5		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	40
Average Marks=(20+40+30+50+40)/8							36

Note: Dimension and Descriptor shall be defined by the respective course coordinator as per the activities

10. SEE- Model Practice Question Paper

Program		Civil Engineering		Semester	III
Course Name		Engineering Mechanics and Strength of Materials	Course Code:25CE33I	Duration	180 min
Sl.no	Questions			CO	Marks
1	One Experimental Question to Conduct hardness test/tensile test/Impact test/ flexural test for a given specimen. Writing Observations, Tabular column and Equation with all notation-5 marks Conduction of Experiment-5 marks Calculation and result with graph-5 marks			1 or 4	15
2	Manual Calculation of Shear force and Bending moment - 5 marks Draw SFD & BMD for Simply supported beam / cantilever beam / overhanging beam with point load and UDL - 5 marks Validation with any analysis software- 5 marks			3	15
3	a. Manual Calculation of Centroid and Moment of Inertia of given section and validate using CADD – 5+5 marks OR b. One question on slope deflection of beams/ column analysis and its validation with any analysis software – 5+5 marks			2 or 5	10
4	Viva- voce				10
Total Marks					50

Note for the External Examiner: The Choice between the questions 3a and 3b shall be done by the external examiner

1) Signature of the Examiner

2) Signature of the Examiner

11. Equipment/software list with Specification for a batch of 30 students

Sl. No.	Particulars	Specification	Quantity
01	Lami's apparatus	It Consists of a board of about 65 x 50cm, with two aluminium pulleys, on clamp, for mounting on board in any desired position. Complete with three mass hangers and 12 slotted masses, each of 50g each.	4
02	Hardness test apparatus	Model Number: TRSN. Test Loads: 60,100,150 kgs (Rockwell) Initial Loads: 10 (kgs) Maximum Test Height: 222 mm. Depth of Throat: 130 mm. Machine Height: 627 mm. Net weight: Approx. 65 kg. Size of base: Approx. 450 * 265 mm.	1
03	Universal Hardness test apparatus	Screen display of hardness value and scale with 0.1-unit resolution Built-in x50 total magnification Variable test sequence timing from 1 to 50 s Multiple loads available - Vickers: 3, 5, 10, 30 and 100 kgf - Brinell: 5, 10, 30, 62.5 and 187.5 kgf	1
04	Impact test apparatus	Model 50 Maximum Capacity Units- J 500 Maximum Scale Graduation Units- J 0.1 Overall Size without Protection Guard (Approx.) L x W x H Units- m 1.1 x 0.45 x 1.65 Overall Size with Protection Guard (Approx.) L x W x H Units- m 2.2 x 1.2 x 2.1 Net Weight of Machine (Approx.) Units- kg 500	1
05	UTM	Force range: 10kN, 20kN, 30kN, 50kN, and 100kN. ... Crosshead speed: 0.05 to 500 mm/min. Speed accuracy: < 0.5% Load cell accuracy: ± 0.5% of reading. Software: software for tensile, compression + bending incl. Electrical supply: 220-230Vac, 50Hz, 1kVA, single phase 3 wires. Accessories	1
06	Dial Gauge With magnetic stand	Clamping Force (N): 600 N Overall Height (mm): 220 mm Applicable for: For Dial Test Indicator Size (mm): 10 mm	4
07	Desktop Computers / Laptops	8 GB RAM, 512GB HARD DRIVE, i5 and above 2.5 GHz PROCESSOR,	15
08	Computer Aided Drafting Software	Any Open source/licensed	1 / computer
09	Any FEM analysis software	Any Open source/licensed	1 / computer



Government of Karnataka
DEPARTMENT OF TECHNICAL EDUCATION

Program	CIVIL ENGINEERING	Semester	III
Course Name	BUILDING PLANNING AND DRAWING	Type of Course	Integrated
Course Code	25CE34I	Contact Hours	91 Hrs./Sem. 7 Hrs./Week
Teaching Scheme	L: P:: 3:4	Credits	5
CIE Marks	50	SEE Marks	50 (Practice)

1. Rationale:

Building Planning and Drawing is a cornerstone of civil engineering education, as it integrates essential skills like design, technical drawing, regulatory knowledge, and sustainability. This subject not only prepares students for the professional challenges they will face in the field but also ensures they have a thorough understanding of how buildings are planned, designed, and executed in real-world scenarios.

2. Course Outcomes: At the end of the Course, the student will be able to:

CO-01	Prepare site plans as per standard/local building bye laws and climatic factors.
CO-02	Develop Plan, Elevation and Cross Sections for a given type of building.
CO-03	Prepare Water Supply and Sanitary Layouts for a building as per standards.
CO-04	Prepare Electrical layout and Firefighting layout as per standards.
CO-05	Prepare Standard Drawings of Rain Water Harvesting Systems Septic tank, Soak Pit and Manhole and Basic 3D Drawings of Buildings.

3. Course Content

WEEK	CO	PO	Theory 3 hours/week	Practice 4 hours/ week
1	1	1,5,7	1. Principles of planning for Residential and Public building- Aspect, Prospect, Orientation, Grouping, Privacy, Elegance, Flexibility, Circulation, Furniture requirements, Sanitation, Economy. Introduction to Rules and bye-laws of sanctioning authorities for construction work as per NBC and Local Building Bye laws. 2. Margin and Maximum Built up Area, Plinth areas for different types of buildings, Permissible built-up areas in margins,	1. Symbols and Sign Conventions used in building drawings as per IS standards by manual drawing.

			Projections in margins, Margins from common plot, Open spaces, Floor area ratio, Carpet area, Super Built-up Area, Key plan (Layout plan), Site plan, building plan and Working plan. Discuss Space requirement and norms for minimum dimension of different units in the residential and public buildings.	
			3. Parking area, Ventilation, Headroom, Mezzanine floor, Corner Plot. Provisions for Persons with Disability and Elderly Persons. Discuss Approvals from Town and Country Planning Department, Read and interpret readymade Architectural building drawing (To be procured from Architect, Planning Consultants, Planning Engineer)	2. Calculation of Floor area ratio, Plinth area and Carpet area for a given building plan.
2	1	1,2,4,5	1. Drawing of Site Plan for a residential building When Set back distances are given. Drawing of Site Plan for a residential when percentage area coverage of building is given.	1. Execute the site plan for a residential building using set back distance/building coverage using CAD.
			2. Manual Drawing of the Cross Section through the wall footing for the given details.	
			3. Manual Drawing of the Cross Section through the wall footing while section line passes through Door and Window for the given details.	2. Drawing of the Cross Section through the wall footing while section line passes through Door and Window using CAD.
3	2	1,4,5,7	1 & 2. Sketch line plan for a 2 BHK residential building including water closet (WC), bath and staircase as per principles of planning.	1. Execution of line plan a residential building of minimum three rooms including water closet (WC), bath and staircase using CAD.
			3. Sketch line plan for a public building such as School building/Hostel building as per principles of planning.	2. Execution of line plan of public building such as School building/Hostel building using CAD.
4	2	1,4,5,7	1 & 2. Draw the following views for a Single Room Building by Manual drawing. i) Plan ii) Elevation iii) Section	1. Draw the following views for a Single Room Building using Manual Drawing. i) Plan ii) Elevation iii) Section
			3. Draw the following views for a Two Room Building by manual drawing. i) Plan ii) Elevation iii) Section	2. Draw the following views for a Two Room Building using Manual Drawing. i) Plan ii) Elevation iii) Section

5	2	1,4,5,7	1,2 & 3. Draw the following views for 1 BHK residential Buildings with schedule of openings. i) Plan, ii) Elevation, iii) Section	1. Execute the building drawing (Plan, Elevation and Section) using CAD software for 1 BHK residential building.
				2. Preparation of footing layout and center line/ grid line (using layers concept) for 1 BHK residential building.
6	2	1,4,5,7	1,2 & 3. Draw the following views for 2 BHK residential Buildings with staircase showing schedule of openings. i) Plan, ii) Elevation, iii) Section	1. Execute the building drawing (Plan, Elevation and Section) using CAD software for 2 BHK residential building
				2. Preparation of footing layout and center line/ grid line (using layers concept) for 2 BHK residential building.
7	2,3	1,4,5,7	1. Introduction to plumbing: Pipe Materials used in building construction works for water supply work - Plastic Pipes, High Density Polyethylene Pipes, Densified cast iron pipes, GI pipes, Stoneware pipes, Asbestos Cement pipes, and Concrete pipes, Hot water pipes with insulation.	1. Marking of footing layout and center line/ grid line of 1 BHK building on the field.
			2. Water supply fittings, their description and uses, water main, service pipes, supply pipe, distribution pipe, domestic storage tank, stop cock, ferrule, gooseneck, water tap, aerators, water meter.	
			3. Merits and Demerits. Connections from water main to buildings. Factors affecting the suitability of plumbing material and accessories for Water supply work, Water pressure test for leakage during installation of pipes.	2. Prepare the furniture Layout/Kitchen cabinets/ wardrobe arrangements for a 1BHK residential building (For the Problem Executed in week 6).
8	2,3	1,4,5,7	1. Importance of Sanitary work for building. Different types of Sanitary pipes and pipe materials used in building construction works for drainage and waste disposal.	1. Execute the building drawing (Plan, Elevation and Section) using CAD software for Primary Health Centre.
			2. Sanitary Fittings- Water Closets, Flushing Cisterns, Urinals, Inspection Chambers, Traps, Anti-siphonage. Connections from building to sewer main.	2. Continued.
			3. Inspection, Testing and Maintenance of Sanitary line in building. Factors affecting the suitability of sanitary material and accessories for Sanitary work.	
9	2,4	1,4,5,7	1. Wiring accessories: SP (single pole switch), DP (double pole switch), ICDP (Iron Clad Double Pole main switch), ICTP (Iron Clad	1. Execute the building drawing (Plan, Elevation and Section) using CAD software for

			Triple Pole switch), change over switch, modular switches, 2 pin socket ,3 pin socket, 2 pin plug top, 3 pin plug top, ceiling rose, round block, switch boards, switch plates, modular switch enclosures, blank insert gang box, junction box, fan box.	School/Hostel building.
			2. Safety devices: Types of fuse units and Materials for fuse wire, Glass cartridge fuse, types of HRC fuse, Kit Kat fuse. Types of MCB, MCCB, RCCB, ELCB Types of Earthing- Pipe earthing, Plate earthing, Lightning arrestors.	
			3. Types of wiring systems and their applications: Surface conduit, concealed conduit, PVC casing capping. Types of wires, cables used for different current and voltage rating, Connection from Electric source to building based on electricity load.	2. Continued.
10	3,4	1,4, 5,7	1. Building Basic Services Preparation of water supply Layout for a residential building using layers command.	1 & 2. Prepare basic service layouts like Water supply, Sanitary, Electrical layouts for residential building using CADD with layers (For the Problem Executed in week 6).
			2. Preparation of Sanitary Layout for a residential building using layers command.	
			3. Preparation of Electrical Layout for a residential building.	
11	4,5	1,4, 5,7	1. Fire classifications, Importance of providing Firefighting system and fire safety requirements in Commercial and Industrial Building.	1. Prepare firefighting layout for a Commercial building in CADD.
			2. Components of the firefighting system and its applications in Commercial and Industrial Building, Fire ratings.	2. Prepare rainwater harvesting unit layout for residential building drawings in CADD.
			3. Importance of conservation of rain water by Rain water harvesting unit in buildings. Components of the rainwater harvesting system.	
12	5	1,4, 5,7	1. Methods of Rainwater harvesting, Benefits of rainwater harvesting unit in buildings.	1. Execute septic tank with soak pit for a building using CADD.
			2. Purpose of using Soak pit with Septic tank and its sizing based on the requirement for different typologies of building.	
			3. Purpose of using Manhole and its sizing based on the requirement for different typologies of building.	2. Execute Manhole drawings for a building using CADD.
13	5	1,4, 5,7	1. 2 & 3. Develop a 3D model of a single room building using any 3D Modelling tool.	1 & 2. Develop a 3D model of a single room building using any 3D Modelling tool.
Total in Hours			39	52

NOTE 1: The course content shall be delivered through lectures, PowerPoint presentations, video demonstrations and field visits.

NOTE 2: The Activity criteria shall be conducted / executed by the student and to be submitted in portfolio evaluation of activities through rubrics to the faculty.

NOTE 3: The PRACTICE (Performance criteria) shall be conducted by the student and observations and report to be submitted at the end of each session to the faculty.

4. References:

- i. Civil engineering drawing by “M. Chakraborti”, Bhaktivedanta book trust
- ii. Building Planning and Drawing- S.S. Bhavikatti, M.V. Chitawadagi, I. K International Publishing House Pvt.Ltd.
- iii. Civil Engineering Drawing and design – D.N. Ghose (CBS Publishers)
- iv. A textbook of Draughtsman Civil (Theory and Practical) – R.S. Mallik and G.S. Meo(Asian publishers, New Delhi).
- v. CAD in Civil Engineering a Laboratory Referral- Dr M.A. Jayaram, D.S.Rajendra Prasad, Sapna Book House.
- vi. Making a simple floor plan using AUTOCAD
<https://www.youtube.com/watch?v=h0865EIE0p0&t=384s>
- vii. https://www.youtube.com/watch?v=U0gbU_EAPRE
- viii. <https://www.youtube.com/watch?v=1jN2QiQ0kr4>
- ix. <https://www.youtube.com/watch?v=p1j92IdDPEM>
- x. https://www.youtube.com/watch?v=c4dIIVvy_yU

5. CIE Assessment Methodologies

Sl. No	CIE Assessment	Test Week	Duration (minutes)	Max marks	Average of all CIE=50 Marks
1.	CIE-1TheoryTest	4	90	50	
2.	CIE-2Practice Test	7	180	50	
3	CIE-3TheoryTest	10	90	50	
4.	CIE-4Practice Test	13	180	50	
5	CIE-5 Portfolio evaluation of all the activities through Rubrics	1-13		50	
Total					50 Marks

6. SEE – Practice Assessment Methodologies

Sl. No	SEE – Practice Assessment	Duration (minutes)	Max marks	Min marks to pass
1.	Semester End Examination-Practice	180	50	20

7. CIE Theory Test model question paper

Program	Civil Engineering			Semester -III	
Course Name	Building Planning and Drawing			Test	I
Course Code	25CE34I	Duration	90 min	Marks	50
Name of the Course Coordinator:					
Note: Answer any one full question from each section. Each full question carries equal marks.					
Q.No	Questions		Cognitive Level	Course Outcome	Marks
Section - 1					
1	a) Discuss the importance of byelaws in building construction. b) Draw the Conventional Representation of Different Building Construction Materials.		R/U/Ap	1/2	25
2	a) For a given building plan Calculate the values of Floor Area Ratio, Plinth area and Carpet area. b) Draw the Site Plan for a residential when percentage area coverage of building is given.		R/U/Ap	1/2	
Section - 2					
3	a) Draw the Cross Section through wall for the given details. b) Sketch line plan for a 2 BHK residential building including water closet (WC), bath and staircase		R/U/Ap	1/2	25
4	a) Draw the following views for a Single Room Building by Manual drawing.(using mini drafter) i) Plan, ii) Elevation & iii) Section		R/U/Ap	1/2	
Note for the Course coordinator: Each question may have one, two or three subdivisions. Optional questions in each section carry the same weightage of marks, cognitive level and course outcomes.					

Signature
Course Coordinator

Signature
Programme Coordinator

Signature
IQAC Chairman

7. CIE Practice Test model question paper (CIE 2)

Program		Civil Engineering			Semester	III
Course Name		Building Planning and Drawing			Test	II
Course Code		25CE34I	Duration	180 min	Marks	50
Name of the Course Coordinator:						
Sl. No	Questions				CO	Marks
1	Portfolio evaluation for practice sessions and activity -Performance criteria (Observations and report)				-	05
2	Sketch line plan for a 2 BHK residential building including water closet (WC), bath and staircase as per principles of planning using CAD.				2	10
3	Draw the following views for 2 BHK residential Buildings with staircase showing schedule of openings using CAD. i) Plan, ii) Elevation, iii) Section				2	30
4	Viva Voce					05
Total Marks						50

Signature of the Course Coordinator

Signature of the HOD

7. CIE Practice Test model question paper (CIE 4)

Program	Civil Engineering			Semester	III
Course Name	Building Planning and Drawing			Test	IV
Course Code	25CE34I	Duration	180 min	Marks	50
Name of the Course Coordinator:					
Sl.No	Questions			CO	Marks
1	Portfolio evaluation for practice sessions and activity -Performance criteria (Observations and report)			-	05
2	Execute the building drawing (Plan, Elevation and Section) using CAD software for a Primary Health Centre/ School Building			2	20
3	Prepare basic service layouts like Water supply/Sanitary/ Electrical layouts/Firefighting/ Rain water harvesting for residential building using CAD with layers.			3/4	20
4	Viva Voce				05
Total Marks					50

Signature of the Course Coordinator

Signature of the HOD

8. Suggestive Activities:

The List is an Example and not inclusive of all possible activities of the course. Student and Faculty are encouraged to choose activities that are relevant to the topic. (Atleast one activity for each Course Outcome)

Sl. No.	Suggestive Activities
1	Study and Prepare report on local building byelaws of your local authority.
2	Take the physical measurement of an existing building and Prepare Plan, Elevation and Sectional Details.
3	Preparation of approval drawing to be submitted to Corporation or Municipality showing required details in one sheet such as a) Site Plan (Land boundary, Building boundary, Car Parking, Passage, sanitary layout, septic tank location etc. b) G.F. Plan, F.F. Plan, Section and Elevation (line diagram is enough) c) Key Plan d) Septic tank Plan and section (line diagram) e) Rain water harvesting pit (with all detail) f) Typical foundation details (Column foundation or spread footing) g) Title block showing – joinery details, Specification, Area statement, color Index, Title of the property, space for owners Signature and Licensed Surveyor's Signature with address.
4	Prepare a 3D Model of a single room building using Google sketch/Revit Architecture/3DS Max

9. Rubrics for Assessment of Activity (Qualitative Assessment)

Sl. No.	Dimension	Beginner	Intermediate	Good	Advanced	Expert	Students Score
		10	20	30	40	50	
1		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	20
2		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	40
3		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	30
4		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	50
Average Marks=(20+40+30+50)/4							35

Note: Dimension and Descriptor shall be defined by the respective course coordinator as per the activities

10. SEE- Model Practice Question Paper

Program		Civil Engineering		Semester	III
Course Name		Building Planning and Drawing	Course Code:25CE34I	Duration	180 min
Sl.No	Questions			CO	Marks
1	Execute the building drawing (Plan, Elevation and Section) using CAD software for 1 BHK/2 BHK residential building/Primary Health Center/ School Building.			2	30
2	Prepare basic service layouts like Water supply/Sanitary/ Electrical layouts for residential building using CADD with layers.			3/4	15
3	Viva- voce				05
Total Marks					50

1) Signature of the Examiner

2) Signature of the Examiner

11. Equipment/software list with Specification for a batch of 30students

Sl. No.	Particulars	Specification	Quantity
01	Computers with Latest Configuration	8 GB RAM, 512GB Hard Drive, I5 and above 2.5 GHz Processor	1/ student
02	Any latest licensed Computer Aided Drafting Software	Ver.2024	1/ Computer
03	Building Information Modelling Software's- Archi cad/Revit Architecture/3DS Max/Sketch Up	Ver.2024 and above	1/ Computer
04	Plotter of Size A0	24 Inch Large Format, Thermal Inkjet Plotter	1
05	LCD Projector	1800 Lumen, Large 120-Inch Display Projection with HDMI+ VGA+AUX+USB Connectivity	1
06	Power Backup	Battery + Inverter	1
07	Stylus For Drawing	Pen Deco01 V2 Digital Graphics Drawing Pen Tablet	1
08	Construction Practice Tool Kit, Pegs, Thread, Tri square, Arrows, Plumbing tool kit.		5 Set