



# GUJARAT TECHNOLOGICAL UNIVERSITY

**Program Name: Diploma in Engineering**

**Level: Diploma**

**Branch: Civil Engineering**

**Course / Subject Code : DI01006011**

**Course / Subject Name : Civil Engineering Drawing**

w. e. f. Academic Year:	2024-25
Semester:	1st
Category of the Course:	PCC

<b>Prerequisite:</b>	Student must be passed class 10 <sup>th</sup> examination from a UGC-recognized board of education. Also, student has interest in technical drawings, building drawings, etc.
<b>Rationale:</b>	Engineering drawing is considered as a language of engineering communication. For a Diploma holder of civil engineering, it became essential to interpret the civil engineering drawing and also to prepare the working drawing and/ or submission drawing as and when required. Therefore, this course has been designed in such a way that a diploma holder can easily produce detailed civil engineering drawing related to construction of single storey, double storey residential/ public/ any other simple civil engineering structures giving due respect to building regulation and by-laws as per local authorities. So, that plan gets approval by local civic authorities.

## Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
01	Interpret given Civil engineering drawing- symbols, conventions, abbreviations and scale.	R & U
02	Plan buildings as per principles of planning, building byelaws and regulation considering green building aspects.	R, U & A
03	Prepare working drawings for the given requirements of Load bearing structures and Framed structures of simple Residential buildings (single and double storied).	R, U & A
04	Draw two-point perspective drawing for given small objects.	R, U & A
05	Propose appropriate building component as per its scope.	R & U

*\*Revised Bloom's Taxonomy (RBT), Where, R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create*



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## Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Tutorial / Practical		
				ESE (E)	PA/CA (M)	PA/CA (I)	ESE (V)	
02	00	04	4	70	30	20	30	150

## Course Content:

Unit No.	Content	No. of Hours	% of Weightage
I	<b>Introduction to Civil Engineering Drawing</b>  1.1 Various types of drawings with their importance and uses. 1.2 Types of projections adopted 1.2.1 First angle projection 1.2.2 Third angle projection 1.2.3 Combinations of first and third angle projection 1.2.4 Advantages and dis-advantages of each type of projection 1.2.5 Situations where each of the above projection is used 1.3 Symbols, Conventions and Abbreviations 1.3.1 Commonly used symbols and conventions for Material of construction, Electric fittings, Water supply and Sanitary, Furniture, Graphical symbols for doors and windows, etc. 1.3.2 Abbreviations used for the above 1.4 Types of lines- visible lines, centre line, hidden line, section line, dimension line, extension line, pointers, arrow head or dots. 1.5 Scale 1.5.1 Definition 1.5.2 Scales used for various types of drawings 1.5.3 Sizes of various standard papers.	3	20%
II	<b>Planning of Building</b>  2.1 Types of Residential Buildings.	8	20%



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	<p>2.2 Site Selection for Residential Building.</p> <p>2.3 Principles of planning for Residential and Public building- Aspect, Prospect, Orientation, Grouping, Privacy, Elegance, Flexibility, Circulation, Furniture requirements, Sanitation, Economy.</p> <p>2.4 Building bye-law of sanctioning authorities for residential buildings.</p> <p>2.4.1 Importance of Building bye-laws</p> <p>2.4.2 Minimum dimensions for Plot area, built up area, super built- up area, plinth area, carpet area, floor area and FSI, FAR, size of rooms, margins, height, passages, ventilation, circulation and others</p> <p>2.4.3 Colour code in Civil Engineering drawing.</p> <p>2.4.4 Approval procedure with respect to bye-laws.</p> <p>2.5 Green Building</p> <p>2.5.1 Concept and components of green building.</p> <p>2.5.2 Evaluation system of various authorities (GRIHA, IGBC)</p> <p>2.6 Line plans for Single storey Residential Building as per principles of planning.</p>		
<b>III</b>	<p><b>Drawings for Residential Building Planning</b></p> <p>3.1 Drawing of Load Bearing Structure</p> <p>3.1.1 Drawing of Single storey Load Bearing residential building (2 BHK) with staircase. Data drawing –detailed plan, elevation, section, site plan, schedule of openings, construction notes with specifications, area statement, Planning and design of stair case- Rise and Tread for residential building.</p> <p>3.1.2 Foundation plan of Load bearing structure.</p> <p>3.2 Drawing of Framed Structure</p> <p>3.2.1 Drawing of Two storey Framed Structure (G+1), residential building (2 BHK) with stair- case. Data drawing – detailed plan, elevation, section, site plan, schedule of openings, construction notes with specifications, area statement. Planning and design of staircase-Rise and Tread for residential and public building.</p> <p>3.2.2 Foundation plan of Framed Structure.</p>	10	30%



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	3.2.3 Details of RCC footing, Column, Beam, Chajjas, Lintel, Staircase and slab.		
<b>IV</b>	<b>Perspective Drawing</b>  4.1 Introduction of perspective view and terms used in perspective drawing. 4.2 Types of perspective 4.2.1 Two Point Perspective of small objects only such as steps, monuments, pedestals. 4.2.2 Two Point Perspective view of single room residential building.	5	15%
<b>V</b>	<b>Building components</b>  5.1 Draw sketches different building components: Wall and column footing, floors and floorings, roofs and roof coverings, false ceiling, doors, windows, ventilators, beam and slab reinforcement, etc.	4	15%
	<b>Total</b>	<b>30</b>	<b>100%</b>

## Suggested Specification Table with Marks (Theory):

Unit No.	Unit Title	Distribution of Theory Marks (in %)						Total
		R Level	U Level	A Level	N Level	E Level	C Level	
<b>I</b>	<b>Introduction to Civil Engineering Drawing</b>	10	10	00	00	00	00	20
<b>II</b>	<b>Planning of Building</b>	5	10	05	00	00	00	20
<b>III</b>	<b>Drawings for Residential Building Planning</b>	5	5	20	00	00	00	30
<b>IV</b>	<b>Perspective Drawing</b>	2	3	10	00	00	00	15
<b>V</b>	<b>Building components</b>	5	10	00	00	00	00	15
	<b>Total</b>	27	38	35	00	00	00	100%

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)



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## References/Suggested Learning Resources:

### (a) Books:

S. No.	Title of Book	Author	Publication with place, year and ISBN
1	Civil engineering Drawing	V.B. Sikka	B.D. Kataria Sons, Ludhiana
2	Civil Engineering Drawing	Gurcharansingh, Subash chander	Standard Publishers Distributors, Delhi
3	Civil Engineering Drawing	R.S.Malek G.S.Meo	New Asian Delhi
4	Civil Engineering Drawing	B.H. Shukla	Atul Prakashan Ahmedabad
5	Building Byelaws	Urban Development Authority	Local Authority e.g. AUDA, GUDA, RUDA, etc.
6	Understanding Construction Drawings	Mark W. Huth Delmar,	Cengage Publishers
7	National Building Code of India	Bureau of Indian Standards	Bureau of Indian Standards, Govt. Of India
8	IS962:1989-code of practice for Architectural and building drawings	Bureau of Indian Standards	Bureau of Indian Standards, Govt. Of India
9	Green Rating for Integrated Habitat Assessment(GRIHA ) Manual	Ministry of New and Renewable Energy, GOI & The Energy and Resources Institute New Delhi	Ministry of New and Renewable Energy, Government of India and The Energy and Resources Institute New Delhi
10	A text book on Green Building	Guttila Yugantha Jaysinghe Shehani Sharadha Maheepala	LAP Lamberd Academic Publishing ISBN13-9786138389187
11	Green building Guidance :The ultimate guide for IGBC	Karthik Karuppu	NotionPress.com ISBN-13978-1684667291



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## (b) Open source software and website:

- www.nptel.iitm.ac.in
- Auto CAD, Zwcad, civil Architect, draw plus X5
- www.Autodesk.com
- www.drawingnow.com
- www.learn-to-draw.com
- www.igbc.in

## Suggested Course Practical List:

The exercises/practical should be properly designed and implemented with an attempt to develop different types of skills so that students are able to acquire the competencies mentioned above.

Sr. No.	Unit No.	Practical/Exercises	Approx. Hours. Required
1	I	Interpretation of building drawings approved under local authority.	02
2	I	Draw symbols, conventions and Abbreviations in A <sub>3</sub> sizes ketch book.	02
3	II	Study of building bye-laws act and national building code(NBC)	02
4	V	Draw Building Components in A <sub>3</sub> size sketchbook: (1) 200mm and 300mm Thick wall foundation (2) Components of Building (3) Components of Staircase (4) Draw different types of staircases (5) RCC Lintel with chajja (6) Column footing (7) Types of Roof (8) Types of doors(any two) (9) Types of window(any two) (10) RCC Beam with reinforcement details (11) RCC slab with reinforcement details (12) Types of flooring	06
5	III	Draw detail plan on drawing sheet-1 (A <sub>1</sub> Size) Line plan, detailed plan, elevation and section of existing building (actual Measurement Drawing).	08
6	IV	Draw detail of foundation plan of one room building/two Room building in sketchbook.	04



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7	IV	Draw working drawings sheet-2(A <sub>1</sub> -size) for single storied residential building (Tenement) on 120sq.m plot with scale and show following detail: GF plan with elevation, section and openings schedule.	08
8	IV	Draw working drawings sheet-3(A <sub>1</sub> -size) for single storied residential building (bungalow) on 260sq.m plot with scale and show following detail: GF&FF plan with elevation, section and opening schedule.	16
9	V	Develop perspective view of steps by two-point perspective method. Drawings sheet-4 (A <sub>2</sub> -size)	04
10	V	Develop perspective view of single room residential building with verandah & steps by two-point perspective method. Drawings sheet-5 (A <sub>1</sub> -size)	08
TOTAL			60

## List of Laboratory/Learning Resources Required:

Following Laboratory and learning resource required

1. Drawing hall with drawing tables
2. Drawing board, minidrafter/T- square/Parallel, and other manual drawing instruments.

## Suggested Project List:

A suggestive list of projects is given here. This has to match the competency and the COs. Similar projects could be added by the concerned course teacher:

- a) Housing Colony: Prepare a scaled layout plan of a housing colony within a plot of 3000 sq.mt to 5000 sq.mt having the variety of bungalows and/or tenements and/or row houses considering bye-laws.
- b) Prepare a suggestive report on upgrading existing building into green building as per IGBC/GRIHA standards.
- c) Apartments: Prepare the detailed plan for apartments.
- d) Model: Prepare a scaled model of a simple building using card board.
- e) Prepare Perspective view of your house.



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## **Suggested Activities for Students:**

Following is the list of proposed student activities like: course/topic based seminars, internet based assignments, teacher guided self-learning activities, course/library/internet/lab based mini-projects etc. These could be individual or group-based.

<b>Sr. No.</b>	<b>Unit No.</b>	<b>Student Activities</b>
1	III	Visit a construction site and collect drawings for the interpretation of drawings.
2	II	Visit an urban development authority office and purchase a Development control regulations (by-laws) of local Body.
3	III	Draw proportionate line sketch, front elevation of any two storey residential building without using any drawing instruments.
4	III	Visit any Residential building (preferable Bungalow) and take measurements of building and draw detailed plan and elevation.

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