

GUJARAT TECHNOLOGICAL UNIVERSITY
NAME OF COURSE : CIVIL ENGINEERING DRAWING

1. RATIONALE :

Drawing is the language of Engineers. The diploma technicians working on site are required to refer drawings and specifications for executing civil engineering works/structures. Hence, Civil Engg. Drawing is a course which every civil engg. technician should learn and develop skills to become successful in their profession. This course is a basic essential course and is the backbone of all Civil Engineers. No technician can supervise or guide civil engg. construction without thorough knowledge and practice of preparing civil engg. drawings. When he is able to prepare drawings, he can interpret drawings, which ultimately will help him to execute or carry out construction work precisely and also estimate the quantities correctly.

2. SCHEME OF TEACHING :

Topic No.	Name of Topic	L hours	P hours
1.	Introduction	3	4
2.	Building bye-laws	3	2
3.	Principles of planning	3	4
4.	Details of building drawing	4	14
5.	Drawing of a building by actual measurements	—	6
6.	Planning residential buildings	5	14
7.	Planning other types of buildings	4	14
8.	Perspective Drawing	4	6
9.	Auto-Cad	1	18
10.	Building components	1	2
	Total hours	28	84

3. TECHNOLOGY RELATED SKILLS (TRS) TO BE DEVELOPED IN THIS COURSE :

TRS - 1 : Plan small residential buildings given the situations and requirements and prepare set of drawings.

EOs :

- 1.1 Understand principles of planning, building bye-laws, I.S. recommendations related to buildings etc., appropriately

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considering the given situations and requirements.

- 1.2 Appreciate the need of
- * Signs
 - * Symbols
 - * Conventions
 - * Abbreviations
 - * Scales used in Civil Engineering Drawing
- 1.3 Prepare set of drawings showing plan, elevation, section, site plan, layout plan, services plan- using appropriate symbols, scales etc.- of the planned small residential building.

TRS - 2 : Use Auto CAD for preparing set of drawings.

EOs :

- 2.1 Use proper Auto CAD commands.
- 2.2 Use Auto CAD My house or 3D Home architecture (Lab Exp. on
to get set of working drawings. Computer)

TRS - 3 : Prepare foundation plan and give layout at construction site.

EOs :

- 3.1 Interpret the given drawing of building.
- 3.2 Prepare ' foundation plan ' of the building
- 3.3 Appreciate the need of establishing permanent reference points.
- 3.4 Identify the instruments, accessories required for giving layout.
- 3.5 Trace down the foundation plan on ground using identified instruments/accessories etc. accurately.
- 3.6 Compare traced ground dimensions with those given in foundation plan.
- 3.7 Correct the layout by applying diagonal checks.

TRS - 4 : Interpret working drawing for guiding & supervising construction.

EOs :

- 4.1 Understand various signs, symbols, abbreviations, scales used in drawings.
- 4.2 Identify each element/component of building shown in drawing.

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- 4.3 Workout each dimension & location of each component of building.

4. COMMUNICATION SKILLS :

1. Express ideas effectively in English in oral form.
2. Express views in English in written form effectively.
3. Write brief and precise proposals and reports.
4. Lead group discussions and meetings independently in English.

5. TOPICS/ SUB-TOPICS

1. Introduction

- 1.1 Introduction
 - 1.1.1 Various types of drawings
 - 1.1.2 Importance of above drawings
 - 1.1.3 Situations where above drawings are prepared/required
- 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 Characteristics of above projections
 - 1.2.5 Advantages and dis-advantages of each type of projection
 - 1.2.6 Situations where each of the above projection is used
- 1.3 Symbols, Conventions and Abbreviations
 - 1.3.1 Commonly used symbols and conventions for
 - * Electric fittings * Water supply *Sanitary
 - * Furniture * Material of construction etc.
 - 1.3.2 Abbreviations used for the above
 - 1.3.3 Actual use of symbols, conventions and abbreviations
- 1.4 Scales
 - 1.4.1 Defination
 - 1.4.2 Scales used for various types of drawings
 - 1.4.3 Title, Margins and size of letters as per IS:
 - 1.4.4 Sizes of various standard papers
 - 1.4.5 Layout of various views on drawing paper

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2. Building bye-laws :

- 2.1 Building bye-law for residential buildings
- 2.2 Building bye-law for industrial buildings
- 2.3 Building bye-law for commercial buildings
(as per I.S. recommendations)
- 2.4 Following important bye-laws for above three types:
 - * Plot area & Built-up area * Size of rooms * Margins
 - * Heights * Passages * Ventilation
 - * Circulation * Open space * Water supply & sanitary
 - * Electrification * Fire safety * Other safety
 - * Lifts * Environment
- 2.5 Approval procedure with respect to bye-laws

3. Principles of planning :

- 3.1 For residential buildings
 - 3.1.1 Principles of planning such as
 - * room dimension * area * heights * privacy * ventilation
 - * access * circulation * economy * drainage * aspect
 - * prospect * orientation * grouping etc.
- 3.2 For other types of buildings
 - 3.2.1 Principles of planning for
 - * school * hospital * bank * post office
 - * shopping centre * office building * industrial unit etc.
- 3.3 Principles of planning for single storey buildings on
 - * regular & irregular grounds * sloping grounds
 - as per the given requirements.

4. Details of building drawing :

- | | |
|---------------------|------------------------------|
| 4.1 Site plan | 4.7 Drawing of details |
| 4.2 Line plan | 4.8 Layout plan |
| 4.3 Detailed plan | 4.9 Services plan |
| 4.4 Elevation | (Plan showing drainage, |
| 4.5 Section | water supply and electricity |
| 4.6 Foundation plan | lines) |

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Importance and purpose of preparing above drawings.

4.10 Details to be shown and location of the details

4.11 Scales used in above drawings

5. Drawing of a building by actual measurements

5.1 Preparation of site plan, Line plan & detailed plan of an existing residential building.

5.1.1 Dimensions to be taken, method of taking dimensions for preparing above plan

5.1.2 Prepare line plan

5.1.3 Rough detailed plan with dimensions written on plan

5.1.4 Noting the dimensions for location of

* doors * windows * ventilators * lofts

* cupboards * steps and other details

5.1.5 Prepare detailed plan, elevation & section and compare it with the existing drawing of the building

5.2 Comment the drawing with respect to principles of planning and building byelaws

6. Planning residential buildings :

6.1 Given situations & plot area; prepare detailed drawing of a single storeyed residential building i.e line plan, detailed plan, elevation and section of the building

6.2 Given situations & plot area; prepare detailed drawing of a two storeyed residential building i.e line plan, detailed ground floor plan, first floor plan, second floor plan, design of stair case, elevation and section

6.3 Other plans and tables required to be submitted for approval

7. Planning other type of buildings :

7.1 Given situations & plot area; prepare detailed drawings for
*school *hospital *bank *post office

*shopping centre *office building *industrial unit etc.

8. Perspective Drawing :

8.1 Related Terms

8.2 Procedure of preparing perspective view
*one point method *two point method

8.3 Draw the perspective view of
*single room residential building with verandah and steps
*column with sloping slab

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9. Auto Cad

9.1 Recall the commands

9.2 Recall the use of Auto Cad

* My house or 3D Home Architecture to get set of working drawings

9.3 One exercise on Auto Cad

10. Building components

10.1 Draw sketches of

* floors and floorings * roofs and roof coverings

* false ceiling * doors * windows * ventilators

* cupboards etc.

6. LAB EXPERIMENT / TERM WORK / PROJECT :

(A) SKETCH BOOK :

Draw sketches of

* Signs, symbols, abbreviations & conventions (Max. 10 in each)

* Types of stairs

* Building Components (sub-structure and super-structure)

* Buildings on sloping ground.

(B) DRAWING SHEETS :

Prepare following sheets

Sheet No 1. Measured Drawing

Sheet No 2. Planning of a Single storeyed residential building (Minimum 2 exercises)

Sheet No 3. Planning of a Two-storeyed residential building (Minimum 2 exercises)

Sheet No 4. Planning of commercial complex with parking

Sheet No 5. Planning of small industrial unit

Sheet No 6. Perspective drawing of

* Steps

* One room structure

* Column

* Garden bench.

(C) Prepare set of drawing of a single storeyed R.B. using computer (Auto CAD)

(D) EXERCISES ON :

* Multi-storeyed building. (framed structure)

* Row-houses.

* Low-cost housing.

7. REFERENCES :

* IS : 962-1967 IS : 1256-1967

* Copy of building bye-laws of the town where the Polytechnic is situated

* Standard text book of civil engineering drawing.