INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)



Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

BUILDING PLANNING AND DRAWING LABORATORY								
IV Semester: CE								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
ACED13	Core	L	Т	Р	С	CIA	SEE	Total
		0	0	2	1	40	60	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 45				Total Classes: 45		
Prerequisite: Computer Aided Engineering Drawing								

I. COURSE OVERVIEW:

The Building Planning and Drawing Laboratory course focuses on practical applications of architectural concepts and technical skills. Students engage in hands-on activities to develop proficiency in architectural drafting, layout planning, and design principles. The lab provides a dynamic environment for students to apply theoretical knowledge to real-world scenarios, emphasizing architectural creativity, precision, and problem-solving. Through exercises in building planning and drawing, participants gain practical experience in translating conceptual ideas into tangible designs, fostering a comprehensive understanding of the architectural process. This course equips students with essential skills for effective communication in the field of architecture, laying the foundation for successful project execution.

II. COURSE OBJECTIVES:

The students will try to learn:

- I. Principles of interpretation of architectural drawings, including floor plans, elevations, sections, and details.
- II. Detailed technical drawings of building components, including doors, windows, and trusses, using industry-standard drafting techniques.
- III. Fundamentals of perspective drawing to enable students to represent three-dimensional aspects of the site and proposed buildings in a visually engaging manner.

III. COURSE OUTCOMES:

At the end of the course students should be able to:

- CO 1 Apply various types of scales as per the need for preparing various types of drawings.
- CO 2 Develop section and elevation for single and multistoried buildings using CAD software.
- CO 3 Draw the detailing of building components like doors, windows, roof trusses.
- CO 4 Create accurate and detailed technical drawings staircase, including section and elevation using appropriate dimensions.
- CO 5 Apply Principles of one-point and two-point perspective drawing to create realistic representations of structures.
- CO 6 Understand the surveying principles, measurement techniques, and scale application to represent the dimensions, layout, and topography of the building site.

IV. COURSE CONTENT:

1. GETTING STARTED EXERCISES

1.1 INTRODUCTION TO AUTOCAD

AutoCAD is a pivotal software in civil engineering, enabling precise drafting, designing, and documentation of architectural and infrastructure projects. Widely used for creating 2D and 3D models, AutoCAD streamlines the design process, enhances accuracy, and facilitates collaboration among civil engineers, architects, and construction professionals.

- i. An Introduction to CAD, Demonstrating knowledge of the theory of CAD software. 2D/3D Drafting, Draw tools command, Modelling an Object.
- ii. The Drawing Tools of CADD
- iii. Practice on commands.
- iv. Building Drawing- An Introduction.
- v. Terminology of building materials and components

Try:

- 1. How do you create a circle using the command line?
- 2. Explain the steps to use the "Offset" command.
- 3. Draw the geometrical shape using different commands

1.2 PLANNING OF BUILDINGS

- a. Describe the process of creating a floor plan in AutoCAD for a residential building. Include the steps for setting up layers, drawing walls, placing doors and windows, and adding dimensions.
- b. Create the front elevation view of the room described in the floor plan. Show the positions of the door and windows, and include details such as window sills and door frames. Ensure to add dimensions and appropriate labels.

Try:

- 1. Draw the plan view of a single room.
- 2. Draw the front elevation of a single room.
- 3. Draw the sectional view of a single room.

3. SINGLE STOREYED RESIDENTIAL BUILDINGS

- a. Draw the floor plan of a single-storeyed residential building with two bedrooms, a living room, a kitchen, and a bathroom. The total area should be approximately 80 square meters.
- b. Draw the floor plan and a sectional view of a single-storeyed cottage with one bedroom, a living room, a kitchen, and a bathroom. The total area should be approximately 60 square meters.

Try:

- 1. Draw the development of plan, elevation and sectional view of a single storeyed office building.
- 2. Draw the development of plan, elevation and sectional view of 1 BHK
- 3. Development of plan, elevation and sectional view of 2 BHK
- 4. Development of plan, elevation and sectional view of 3 BHK

4. SINGLE STOREYED PUBLIC BUILDINGS

- 4.1 Draw the floor plan of a single-storeyed public library with a main reading area, a computer room, a reception desk, and a restroom. The total area should be approximately 100 square meters.
- 4.2 Create the front elevation view of a single-storeyed community center with large entrance doors, windows, and a flat roof. Show the positions of the doors, windows, and any exterior design elements. Ensure to add dimensions and appropriate labels.

Try:

- 1. Draw the floor plan and a sectional view of a single-storeyed health clinic.
- 2. Create the planning of school building.
- 3. Create the planning of auditorium.

5. MULTI STOREYED RESIDENTIAL BUILDINGS

- 5.1 Create the front elevation view of a multi-storeyed high-rise residential building with balconies, large windows, and a central entrance. Show the positions of the balconies, windows, and entrance. Ensure to add dimensions and appropriate labels.
- 5.2 Draw the floor plan of the ground floor and first floor of a duplex residential building. Each floor should include a living room, a kitchen, and a bathroom. Create a sectional view showing the staircase and key structural elements. Include dimensions and labels.

Try:

- 1. Development of plan, elevation, sectional view of a Multi-storeyed building.
- 2. Create a floor plan of G+1 Building with 2 bedrooms, 1 living room and 1 study room.

6. MULTI STOREYED COMMERCIAL BUILDINGS

- 6.1 Draw the floor plan of a typical floor in a multi-storeyed office building with four office spaces, a central corridor, a reception area, and restrooms. Include the placement of doors, windows.
- 6.2 Create the front elevation view of a multi-storeyed commercial complex with large display windows on the ground floor for retail spaces, office windows on upper floors, and a central entrance.

Try:

- 1. Draw the floor plan of a typical floor in a multi-storeyed hotel with six guest rooms, a central corridor, and a utility room. Create a sectional view showing the layout of rooms, corridors, and structural elements like walls and floors. Include dimensions and labels.
- 2. Draw the plan, elevation and sectional view of shopping mall with 2 banquet hall.
- 3. Draw the plan, elevation and sectional view of Office Building
- 4. Draw the plan, elevation of Hostel Building

7. MULTI STOREYED HOSTEL BUILDING

- 7.1 Draw the floor plan of a typical floor in a multi-storeyed hostel building with eight doubleoccupancy rooms, a common lounge area, and shared bathrooms.
- 7.2 Draw the floor plan of the ground floor and first floor of a multi-storeyed dormitory building. Each floor should include four rooms with four beds each, a common study area, and shared bathrooms.

Try:

- 1. Draw Plan of hostel building including all specified rooms and common areas, accurately placing doors, windows
- 2. Draw Sectional view of a G+3 hostel building. Each floor should include four rooms with four beds each, a common study area, and shared bathrooms.

8. BUILDING COMPONENTS - DOORS

- 8.1 Draw the plan and elevation view of a sliding door system with an opening of 1.8 meters by 2.1 meters.
- 8.2 Draw the detailed plan and elevation view of a standard single-leaf door with dimensions 0.9 meters by 2.1 meters.

- 1. Development of detailed plan and elevation of fully paneled doors.
- 2. Development of elevation and sectional view of flush doors

9. BUILDING COMPONENTS- WINDOWS

- 9.1 Draw the elevation view of a standard sliding window installed in a wall section. Include details of the window frame, tracks, and glazing. Ensure to add dimensions and appropriate labels for all elements.
- 9.2 Create the elevation view of a casement window installed in a wall section. Include dimensions and labels for all elements.

Try:

- 1. Development of elevation and sectional view of windows- Half paneled window.
- 2. Development of elevation and sectional view of windows- half-glazed window
- 3. Draw the elevation and plan of sliding window of width 1.5 m and height 1.7 m.

10. BUILDING COMPONENTS- TRUSSES

- 10.1 Draw the detailed plan and elevation views of a King Post Truss for a single-storeyed building with a span of 10 meters. Include all components such as the rafters, tie beam, king post, and struts. Ensure to label all elements and include dimensions.
- 10.2 Draw the detailed plan and elevation views of a Queen Post Truss for a building with a span of 12 meters. Include all components such as the rafters, tie beam, queen posts, and struts. Ensure to label all elements and include dimensions.

Try:

- 1. Draw the plan and elevation views of a Pratt Truss for a bridge with a span of 20 meters.
- 2. Create the plan and elevation views of a Howe Truss for a single-storeyed industrial building with a span of 15 meters.
- 3. Draw the elevation of north roof truss.

11. BUILDING COMPONENTS- FOOTINGS

- 11.1 Draw the plan and sectional view of a single column footing for a residential building. Show the dimensions of the footing, the column, and the reinforcement details.
- 11.2 Draw the plan and sectional view of a single isolated footing for a residential building column. Show the dimensions of the footing, the column, and the reinforcement details. Ensure to label all elements and include dimensions.

Try:

- 1. Create a footing plan with dimensions for a rectangular footing measuring 2 meters by 3 meters. Include reinforcement bars with proper spacing and dimensions.
- 2. Design a combined footing plan for two columns, each with a load of 50 kN. The distance between the columns is 3 meters. Provide appropriate dimensions and reinforcement details for the footing.
- 3. Draw the elevation view of a circular footing with a diameter of 4 meters and a depth of 1 meter. Ensure proper thickness and reinforcement details.

12. TYPES OF STAIRS: PLAN AND SECTIONAL DRAWINGS

12.1 Draw the plan and sectional view of a straight staircase with 12 steps, including a landing at the top. Show the dimensions of each step, the width of the staircase, and the height of the landing. Ensure to label all elements and include dimensions.

12.2 Create the plan and sectional view of an L-shaped staircase connecting two floors. The staircase should have a turn at a landing midway. Show the dimensions of each segment, including the landing area and the heights of the risers. Ensure to add appropriate labels and dimensions.

Try:

- 1. Draw the elevation of straight Stairs with a Central Landing.
- 2. Draw the plan and sectional view of a spiral staircase with 10 steps.
- 3. Draw the elevation of U Shaped Staircase.

13. SITE PLAN

- 13.1 Create a site plan for a residential property measuring 20 meters by 30 meters. Include the placement of a single-storeyed house, driveway, garden area, and boundary walls. Ensure to label all elements and include dimensions.
- 13.2. Create a site plan for a university campus area measuring 100 meters by 150 meters. Include academic buildings, administrative offices, student amenities, parking lots, and green spaces. Show pedestrian pathways and vehicular circulation routes. Ensure to label all elements and include dimensions.

Try:

- 1. Draw developed plan, elevation, section, site plan from the given line plan from framed structure
- 2. Draw a site plan for a recreational park area covering 50 meters by 50 meters. Include playgrounds, picnic areas, walking trails, and restrooms. Show the layout of benches and other amenities. Ensure to add dimensions and appropriate labels.
- 3. Prepare submission drawing of the given framed structure residential building.
- 4. Prepare foundation plan of framed structure.

14. PERSPECTIVE DRAWING: TWO POINT PERSPECTIVE DRAWING

- 14.1 Create a two-point perspective drawing of a simple box. Show the sides of the box converging towards two vanishing points. Include details such as edges and internal lines to demonstrate depth. Ensure to add dimensions and appropriate labels.
- 14.2 Draw a small house in two-point perspective. Include features such as a pitched roof, windows, a door, and a chimney. Show the convergence of lines towards two vanishing points. Ensure to add dimensions and appropriate labels.

Try:

- 1. Draw two-point perspectives drawing of small objects- steps, monuments.
- 2. Draw, plan, elevation, eye level picture plane and vanishing points.
- 3. Draw perspective view of a table.

V. TEXT BOOKS:

- 1. N.D. Bhatt; Engineering Drawing Charotar Publishing House PVT Ltd, 15th edition 2011.
- 2. K. Venugoplal; Engineering Drawing and graphics Using AutoCAD, 3rd edition 2007

VI. REFERENCE BOOKS:

- 1. Emmons, Paul. Drawing Imagining Building: Embodiment in Architectural Design Practices. Routledge, 2019.
- 2. Edwards, Brian. Understanding architecture through drawing. Taylor & Francis, 2008.

VII. ELECTRONICS RESOURCES:

- 1. https://www.cphbooks.in/product/building-planning-and-drawing-by-dr-n-kumara-swamy-a-kameswara-rao/
- 2. https://nptel.ac.in/courses/112103019