INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

BUILDING PLANNING AND CONSTRUCTION								
II Semester: CE								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
-ACEE01	**Foundation**	3	0	0	3	40	60	100
Contact Classes: 48	**Tutorial Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 48**		
Prerequisite: Concrete Technology								

I. COURSE OVERVIEW:

This course introduces students to the fundamental aspects of building planning, including classification of buildings, site selection, and the impact of climate, orientation, and landscaping. It covers essential principles of architectural planning, building bye-laws, and the National Building Code (NBC) with a focus on residential structures. Students will gain foundational knowledge of various building components such as foundations, floors, roofs, doors, windows, and staircases. The course also explores finishing techniques, scaffolding systems, and formwork methods used in construction. Emphasis is placed on theoretical understanding and standard practices to prepare students for practical applications in the field.

II. COURSE OBJECTIVES:

The students will try to learn:

I. The fundamental concepts of buildings and understand how climate, orientation, and landscaping influence building planning.
II. The essential principles of architectural planning and spatial organization for achieving functional and aesthetic layouts.
III. The structure, scope, and guidelines of the National Building Code (NBC) with a focus on residential building standards.
IV. The basic building components along with common finishing works and temporary structures such as scaffolding and formwork used in construction.

III. COURSE OUTCOMES:

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

CO1 Classify different types of buildings and site selection criteria based on climatic zones to establish suitable conditions for residential planning.
CO2 Explain the principles of building planning and the significance of orientation to ensure comfort and efficiency in building layout.
CO3 Interpret the building bye-laws and National Building Code provisions to determine regulatory compliance in residential building planning.
CO4 Identify the functions and types of building foundations and masonry systems to recognize appropriate basic construction practices.
CO5 Describe various building components such as floors, roofs, stairs, doors, and windows to understand their relevance in construction and usage.
CO6 Summarize the purpose and types of construction finishes, scaffolding, and formwork to appreciate standard site practices and safety considerations.

IV. COURSE CONTENT:

MODULE –I: FUNDAMENTALS OF BUILDINGS (9)

Fundamentals of Buildings: Building, Classification of buildings, Site selection for Residential buildings, Climate and its influence on building planning; Elements of Climate, Climatic Zone of India, Climate and comfort, Earth and its motion, Directions and their characteristics, Landscaping.

Orientation of buildings: orientation, Factors affecting orientation, Sun, Wind, Rain, CBRT suggestions orientation criteria for Indian conditions.

MODULE -II: PRINCIPLES OF PLANNING AND BYE LAWS OF BUILDINGS (9)

Principles of planning and Bye Laws of buildings: Aspects, prospect, Privacy, Furniture Requirements, Roominess, Grouping, Circulation, Elegance, Economy, Practical consideration.

Buildings bye Laws: Introduction, Objective, Principles, Applicability of building bye Laws. Introduction to National building code, Objectives, Scope, Structure of NBC. General Building Requirements, Guidelines for Residential Buildings. Building Heights, Setbacks, FAR/FSI. Open Spaces, room sizes, Lighting and Ventilation, Means of Access and service ducts. Classification of buildings for fire safety.

MODULE -III: FOUNDATIONS (9)

Introduction to building construction and site preparation; components of Building, Foundations: Functions & Requirements, Types of Shallow Foundations: isolated footings, combined footings, strap footings, wall footings, raft foundations.

Types of Deep Foundations: driven piles (timber, precast concrete, steel), bored cast-in-situ piles. Brick masonry – types – bonds; Stone masonry – types.

MODULE -IV: BUILDING COMPONENTS: FLOORS, ROOFS, STAIRS, DOORS & WINDOWS (10)

Floors, Roofs, Stairs, Doors, Windows: Types of floors: Ground and upper floors – Brick flooring, Cement concrete flooring, Stone flooring, Tiled flooring, Types of roofs – Flat, Pitched, Sloped, Curved roofs Components and classification of staircases – Straight flight, Dog-legged, Open well, Spiral staircases –Types of doors – Panelled, Flush, Glass, PVC, Aluminum, Steel, Sliding, Revolving, Collapsible, and Rolling shutter doors – Door frame materials and fittings. Types of windows.

MODULE -V: CONSTRUCTION FINISHING AND FORMWORK TECHNIQUES (10)

Finishing Works: Plastering – Purpose, types, tools and techniques – Defects in plastering. Pointing – Types and application areas – Differences between plastering and pointing.

Scaffolding, Formwork, and Centering: Scaffolding – Definition, purpose, components – Types: Single, Double, Cantilever, Suspended, Trestle, Steel and patented scaffolds – Safety considerations. Formwork – Functions, materials (timber, steel, aluminum, plastic), formwork for slabs, beams, columns, and walls – Centering: Definition and role in arches and domes.

V. TEXTBOOKS:

1. Raphael, Benny. Building Automation from Concepts to Implementation. Routledge, 2022.
2. Swamy, N. Kumara, and A. Kaneswaran Rao. Building Planning and Drawing. Revised ed., Charotar Publishing House, 2020.
3. Punmia, B. C., Ashok Kumar Jain, and Arun Kumar Jain. Building Construction. 11th Edition, Laxmi Publications, 2022.
4. Bhavikatti, S. S. Building Materials and Construction. 4th Edition, Vikas Publishing House, 2020.

VI. REFERENCE BOOKS:

1. Kumar, Sushil. Building Construction. Standard Publishers Distributors, 21st Edition, 2022.
2. Balan, Bindu, and R. Sathish Kumar. Climatology and Building Design. McGraw Hill Education, 1st Edition, 2020.
3. Singh, Gurcharan. Building Planning, Designing and Scheduling. Standard Book House, 6th Edition, 2019.

VII. ELECTRONICS RESOURCES:

1. https://cursa.app/free-courses-construction-online
2. https://www.rakenapp.com/ebooks

VIII. MATERIAL ONLINE:

1. Course template
2. Tutorial question bank
3. Tech talk topics
4. Open end experiments
5. Definitions and terminology
6. Assignments
7. Model question paper - I
8. Model question paper - II
9. Lecture notes
10. E-learning readiness videos (ELRV)
11. Power point presentation