

23CE2501: GREEN BUILDINGS

Course Code	23CE2501	Year	III	Semester	I
Course Category	Open Elective - 1	Offering Branch	CE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Nil
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

Course Objectives

- To introduce the concept, importance, and benefits of green buildings and sustainable construction.
- To understand green building practices, rating systems, and energy-efficient strategies in India.
- To learn the principles of green building design focusing on energy reduction and use of renewable energy sources.
- To study energy-efficient HVAC systems and eco-friendly power generation techniques in green buildings.
- To explore material conservation methods and indoor environmental quality standards for healthy building design.

Course Outcomes:

CO	Statement	Blooms level
CO 1	Explain the need for sustainable development in the built environment and the foundational concepts, materials, and benefits of green buildings.	L2
CO 2	Analyze green building practices, energy efficiency measures, and rating systems such as LEED, IGBC, and GRIHA, with emphasis on Indian initiatives.	L4
CO 3	Apply green building design strategies, including passive techniques, onsite renewable energy integration, and energy demand reduction.	L3
CO 4	Investigate the effectiveness of HVAC, lighting, and ventilation systems in terms of energy performance and indoor environmental quality for occupant health and comfort.	L4
CO 5	Assess sustainable material choices, waste management practices, and IAQ improvement methods to support environmentally responsible construction.	L5

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	–	–	–	3	2	–	-	–	2	3	2
CO2	3	3	2	2	2	3	2	–	–	–	2	3	3
CO3	3	2	2	–	2	3	–	-	–	2	2	3	3
CO4	3	2	2	2	2	2	–	-	–	2	2	3	3
CO5	3	3	–	2	2	3	2	-	-	–	2	3	3
Avg.	3	2	2	2	2	3	2			2	2	3	3

Syllabus		
UNIT	Content	MappedCO
I	Introduction; What is Green Building, Why to go for Green Building, Benefits of Green Buildings, Green Building Materials and Equipment in India, What are key Requisites for Constructing a Green Building, Important Sustainable features for Green Building	CO1, CO2
II	Green Building Concepts and Practices Indian Green Building Council, Green Building Moment in India, Benefits Experienced in Green Buildings, Launch of Green Building Rating Systems, Residential Sector, Market Transformation; Green Building Opportunities And Benefits: Opportunities of Green Building, Green Building Features, Material and Resources, Water Efficiency, Optimum Energy Efficiency, Typical Energy Saving Approach in Buildings, LEED India Rating System and Energy Efficiency.	CO2, CO3
III	Green Building Design Introduction, Reduction in Energy Demand, Onsite Sources and Sinks, Maximise System Efficiency, Steps to Reduce Energy Demand and Use Onsite Sources and Sinks, Use of Renewable Energy Sources. Eco friendly captive power generation for factory, Building Requirement.	CO3, CO5
IV	Introduction to HVAC, CII Godrej Green business centre, Design philosophy, Design interventions, Energy modeling, HVAC System design, Chiller selection, pump selection, Selection of cooling towers, Selection of air handling units, Precooling of fresh air, Interior lighting system, Key feature of the building. Eco-friendly captive power generation for factory, Building requirement.	CO3, CO4
V	Material Conservation Handling of non-process waste, waste reduction during construction, materials with recycled content, local materials, material reuse, certified wood, Rapidly renewable building materials and furniture; Indoor Environment Quality And Occupational Health: Air conditioning, Indoor air quality, Sick building syndrome, Tobacco smoke control, Minimum fresh air requirements avoid use of asbestos in the building, improved fresh air ventilation, Measure of IAQ, Reasons for poor IAQ, Measures to achieve Acceptable IAQ levels.	CO4, CO5

Learning Recourse(s)**Text Book(s)**

1. Handbook on Green Practices published by Indian Society of Heating Refrigerating and Air conditioning Engineers, 2009.
2. Green Building Hand Book by Tom woolley and Samkimings, 2009. Recommended

Reference books

1. Complete Guide to Green Buildings by Trish riley
2. Standard for the design for High Performance Green Buildings by Kent Peterson, 2009