

INSTITUTE	FACULTY OF TECHNOLOGY
PROGRAM	BACHELOR OF TECHNOLOGY (CIVIL ENGINEERING)
SEMESTER	7
COURSE TITLE	SUSTAINABLE BUILDING TECHNOLOGY
COURSE CODE	01CI0726
COURSE CREDITS	3

Objective:

- 1 To gain an understanding of the fundamentals of green design and sustainable development
- 2 To determine different areas where green design solutions should be included in projects to improve the built environment
- 3 To become familiar with the official requirements for creating and certifying green designs.

Course Outcomes: After completion of this course, student will be able to:

- 1 Demonstrate green concept skills and apply tools of green building assessment
- 2 Analyze appropriate green building materials and techniques for specific construction projects
- 3 Evaluate engineering principles for design and construction of green structures to enhance sustainability and efficiency
- 4 Create detailed performance evaluation reports of buildings using IGBC, LEED, & GRIHA standards.

Pre-requisite of course: Building Construction Technology

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	0	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	Introduction Life Cycle impacts of materials and products, sustainable design concepts, strategies of Design for the Environment, The sun-earth relationship and the energy balance on the earth's surface, climate, wind, Solar radiation and solar temperature, Sun shading and solar radiation on surfaces, Energy impact on the shape and orientation of buildings, Thermal properties of building materials, Green building rating systems: LEED & GRIHA etc	10

Contents : Unit	Topics	Contact Hours
2	Energy Efficient Buildings Passive cooling and day lighting, Active solar and photovoltaic, Building energy analysis methods, Building energy simulation, Building energy efficiency standards, Lighting system design, Lighting economics and aesthetics, Impacts of lighting efficiency, Energy audit and energy targeting, Technological options for energy management	12
3	Water Conservation and Waste Water Management Introduction to Water Conservation and Wastewater Management, Water Scarcity and Pollution: Global Challenges and Local Implications, Sustainable Building Design Principles and Water Efficiency, Greywater Recycling and Reuse in Buildings, Regulatory Frameworks and Policy Considerations for Sustainable Water Management, Societal Impact and Community Engagement in Water Conservation Initiatives	8
4	Indian Green Building Council Guidelines Introduction; IGBC green new building Rating system , Overview and process – project checklist; Sustainable architecture and design; Site selection and planning; Water conservation and energy efficiency; Building materials and resources; Indoor Environment quality; Innovation and development, Net zero energy buildings, Net zero water buildings, Net zero waste to landfill rating system, Net zero carbon guidelines	12
Total Hours		42

Textbook :

- 1 Sustainable Construction: Green Building Design and Delivery, Kibert, C., John Wiley & Sons, 2005

References:

- 1 An Energy Approach- Air-conditioning Principles and Systems, An Energy Approach- Air-conditioning Principles and Systems, Edward G Pita, Pearson Education, 2003

Suggested Theory Distribution:

The suggested theory distribution as per Bloom’s taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
10.00	35.00	25.00	15.00	10.00	5.00

Instructional Method:

- 1 Prerequisite of the course and its pattern shall be discussed on the commencement of the course
- 2 Lectures shall be conducted in class room using various teaching aids
- 3 Presence in all academic sessions is mandatory which shall carry 5% marks of the total internal evaluation
- 4 At the end of each unit/topic an assignment based on the course content shall be given to the students which shall carry 5% weightage for timely completion and submission of the assigned work.

Supplementary Resources:

- 1 <https://archive.nptel.ac.in/courses/105/102/105102195/>
- 2 https://onlinecourses.nptel.ac.in/noc19_ce40/preview