Marwadi University

**Master of Technology**

**Construction Project Management**

# Green Building in Construction

# 01CP0205

**Objective of the Course:**

- To make students aware regarding Sustainability in construction.
- To provide knowledge regarding the concept of Green Building in Construction.
- Interpret various rating systems in Green building construction projects.
- To demonstrate various advantages of sustainability and green construction techniques.

**Credit Earned: 3**

**Students learning outcomes:**

After successful completion of the course, it is expected that student will be able to,

1. Understand the fundamental concepts Sustainable developments.
2. Identify the concepts and techniques of green building construction.
3. Interpret strategies for development of Green and Sustainable design in projects.
4. Analyze the various guidelines and Certifications for Green Building in Construction projects.

**Teaching and Examination Scheme**

| Teaching Scheme (Hours) | | | Credits | Theory Marks | | | Tutorial/ Practical Marks | | Total Marks |
|---|---|---|---|---|---|---|---|---|---|
| Theory | Tutorial | Practical | | ESE (E) | IA (M) | CSE (I) | Viva (V) | Term Work (TW) | |
| 03 | 00 | 00 | 03 | 50 | 30 | 20 | 25 | 25 | 150 |

**Detailed Syllabus**

| Sr No. | Title of the unit | Number of hours |
|---|---|---|
| **1** | **Introduction** | **12** |
| | Concept of Green building and sustainable development, Need and Importance, Salient features of Green Building, Design and Characteristics of Green Building, Introduction to High performance building; Integrated design process of high performance building, Requirements for development of Green Building Projects | |
| **2** | **Green Building Materials** | **10** |
| | Introduction to Green Building materials, Low emitting materials, Building and material reuse, Life cycle analysis and cost assessment of building materials and products, Building materials and finishes- its Environmental Impact, Construction waste management. | |

| | | |
|---|---|---|
| **3** | **Sustainable Development for Green Construction.** | **08** |
| | Introduction to the 4Rs of Development, Reduce, Reuse and Recycle and Recover, Local and regional materials for Green Building Construction | |
| **4** | **Green Building Rating Systems - Overview** | **08** |
| | Introduction to Green Building Rating Systems, Overview of all Systems, Need for a green building rating, General Parameters and aspects. LEED, GRIHA, IGBC green new building Rating system – Overview, project checklist, Site selection and planning; Water conservation and energy efficiency, Building materials and resources. | |
| **5** | **Energy efficient designs** | **04** |
| | 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. | |
| | **Total** | **42** |

**Suggested Theory Distribution**

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

| Distribution of Theory for course delivery and evaluation | | | | | |
|---|---|---|---|---|---|
| Remember | Understand | Apply | Analyze | Evaluate | Create |
| 15% | 15% | 20% | 20% | 20% | 10% |

**Instructional Method and Pedagogy:**

1. Use of Learning Management system like canvas
2. Demonstration through presentations on power point and videos and lectures
3. Brainstorming and group discussion sessions
4. Collaborative learning

## Recommended Study Material

### Text Books:

1. Handbook for Building Engineers in Metric systems, NBC, New Delhi, 1968

2. Building Construction: Dr. B.C. Punmia, Ashol K Jain, A.K Jain

3. The Lighting of buildings: R.G.Hopkinson and J.D.Kay, Faber and Faber, London, 1969

### Reference Books:

1. Sam Kubba, "Hand book of Green building Design and construction", Elsevier Architecture press.

2. Abe Kruger and Carl Seville, “Green building: principals and practice in residential construction”, Cengage Learning.

3. IGBC Green New building rating system (Version 3.0), March 2015.
4. GRIHA Manual Volume-1: Introduction to National Rating System by Ministry of New and Renewable Energy, Government of India and the energy and resource institute, New Delhi.
5. Kibert, C. “Sustainable Construction: Green Building Design and Delivery”, John Wiley & Sons, 2005
6. Edward G Pita, “An Energy Approach- Air-conditioning Principles and Systems”, Pearson Education, 2003