



**Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore**  
**Shri Vaishnav Institute of Technology and Science**  
**Choice Based Credit System (CBCS) in Light of NEP-2020**  
**Civil Engineering Department**  
**Generic Elective (Undergraduate Program)**

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY		PRACTICAL			L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
<b>GUCE401</b>	<b>GE</b>	<b>Fundamentals of Green Buildings</b>	60	20	20	0	0	4	0	0	4

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit.

\***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

**Course Educational Objectives (CEOs):**

1. Learn the principles of planning and orientation of buildings.
2. Acquire knowledge on various aspects of green buildings

**Course Outcomes (COs):**

The student will be able to

1. Understand the concepts of green buildings.
2. Explain the principles of building planning, its bylaws.
3. Understand the aspects related to design of green buildings.

**Syllabus:**

**UNIT I**

**12 Hrs.**

**Basics of Material Sustainability:** Ecological footprint, Basics of carbon cycle, Factors affecting carbon cycle, Urban environment, Fundamentals of sustainability, Life cycle assessment, Role of materials, Primary energy, Secondary energy, Embodied energy.

**UNIT II**

**12 Hrs.**

**Green Building Technologies:** Introduction: Definition of Green building, Benefits of Green building, Principles of Green building- planning concept of Green Building, Environmental design (ED) strategies for building construction.

**UNIT III**

**12 Hrs.**

**Water & Energy Conservation in Buildings:** Need for energy conservation in buildings, various forms of energy used in buildings, embodied energy of materials, energy used in transportation and construction processes – Water Conservation systems in Buildings, water harvesting in buildings, waste to energy in residential complexes, Modular wastewater treatment systems

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#### UNIT IV

**12 Hrs.**

**Materials:** Local building materials, Natural and renewable materials like bamboo, timber, rammed earth, stabilized mud blocks, Materials with recycled content such as blended cements, pozzolana cements, fly ash bricks, vitrified tiles, materials from agro and industrial waste, Reuse of waste and salvaged materials.

#### UNIT V

**12 Hrs.**

**Rating System for Green Building:** Leadership in Energy and Environmental Design (LEED) criteria, Indian Green Building council (IGBC), Green rating, Green Rating for Integrated Habitat Assessment. (GRIHA) criteria HVAC unit in green Building roofing.

#### Textbooks:

1. Introduction to Green Buildings & Built Environment, IGBC, BSP Books Pvt. Ltd., 2023
2. Alternative Building Materials and Technologies, K. S. Jagadish, B. V. Venkatarama Reddy and K. S. Nanjunda Rao, 2nd Edition, New Age International, 2023
3. Green Building Materials and Techniques, Vinod B R and Shobha R, Notion Press, 2023

#### Reference Books:

1. Mili Majumdar, “Energy-efficient buildings in India” Tata Energy Research Institute, 2002.
2. TERI “Sustainable Building Design Manual- Volume I & II” Tata Energy Research Institute, 2009

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