GREEN BUILDINGS AND INFRASTRUCTURE

(Open Elective-II)

Course Code: 15CE1166

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Pre-requisites: Environmental Studies.

Course Outcomes:

At the end of the course the student shall be able to:

CO1: Impart knowledge on Green Building objectives, climate and environment

CO2: Apply the knowledge in development of green field infrastructure in relation to sustainable environment

CO3: Demonstrate the passive energy system and components of building fabrics and materials

CO4: Impart the knowledge on active energy systems, utilities and services and O&M

CO5: Impart the knowledge on indoor air quality and building rating systems

UNIT-I **(10 Lectures)**

INTRODUCTION: Introduction to Green Buildings

MACRO- ENVIRONMENT: Elements of climate, weather, Water cycle, Carbon cycle, Environmental quality, Deforestation, climatic change, Ozone depletion and implications.

MICRO-ENVIRONMENT: Natural environment vis-à-vis built in environment. Living environment characteristics and components of Urban Ecosystem, solar radiation, heat flow, air-movement, Land use, drainage and sanitation.

UNIT-II **(10 Lectures)**

CONCEPTS OF GREEN FIELD DEVELOPMENT :

Brown field development, environmental impact and ecological balance, FAR, layouts, sustainable Site development, vegetation, landscape elements, alternative services and technologies, rain water harvesting, on site sewerage retention, treatment, recycle and reuse.

UNIT -III **(10 Lectures)**

BUILDING RESOURCES:

Passive energy system Design, Building envelope, orientation and components of building fabric and shading, High rise buildings, modular building Construction of curtain walls, Sourcing and recycling of building materials, alternative calcareous, metallic and non metallic, materials

UNIT-IV **(10 Lectures)**

BUILDING INFRA STRUCTURE:

Active Energy Systems in buildings, Utilities and services, building automation. Electro-mechanical systems, lifts and transportation, captive power plant and equipment, operation & maintenance

UNIT-V **(10 Lectures)**

INDOOR AIR QUALITY

Fresh air requirements standards, Sick Building Syndrome and pollutants.

BUILDING RATING SYSTEMS

Building auditing, points system, components, and weightage, agencies and institutions, GBC, TERI etc, green buildings in the contexts of Indian sub continent.

TEXT BOOKS:

1. Koenigsberger, O.H., Manual of Tropical Housing and Building, Orient Longman publishers, Chennai, 1st Ed., 2003.

2. Odum, P. Eugene., Ecology and Environments, Oxford and IBH Publishers, New Delhi, 2nd edition, 2005.

REFERENCES:

1. Greening Building – Green Congress, US.(web).

2. HSMI. Sustainable Building Technology – HUDCO, HSMI (Human Settlement Management Institution, New Delhi.