

## AMID-27 ENVIRONMENTAL CONTROL – II

### **Course overview:**

The focus of the course is to impart scientific building design and site planning as related to climate, particularly to tropical climates as found in India by giving importance for human comfort in interior spaces through natural elements.

### **Objectives of the course:**

To equip the students with the basic understanding of climatic types in India and the impact on requirements of building design and site planning. To introduce them for planning for thermal comfort, day lighting and natural ventilation, familiarize them with the data, methods, principles, standards and tools for planning and designing for climatic comfort.

### **Expected skills/ knowledge Transferred:**

The student should be able to predict climatic conditions in a given building and redesign for given parameters.

### **Course Content:**

#### **Unit – I**

Introduction – Climate and built form interaction. Global climatic factors, elements of climate, impact and issues of climatic balance in traditional and contemporary built environments, issues of ecological balance, implications of climatic forces in nature of spaces and forms. Patterns of organization and elements of built form at individual building.

#### **Unit – II**

Thermal comfort and heat flow: Thermal comfort factors, physiological aspects. Body heat balance. Building climatological site analysis, application of comfort diagrams, introduction to basic thermal units, theory of heat flow, heat transmission, thermal properties of materials, human heat balance. Physiological comfort, outdoors and indoors, heat flow within buildings, steady state conditions and periodic flow, thermal performance of building elements.

#### **Unit –III**

Sun and Design process – Solar charts, sun angles and shadow angles, orientation for sun, sun control, design of shading devices, radiation, glare, solar energy and its technical applications. Climate and material choices, color and texture choices for interior spaces.

### **Reference Books:**

1. Koeinsberger, O.H. and others, Manual of Tropical Housing and Building. Orient Longman, Chennai, 2003. Konya Allan, Design for Hot Climates.

2. Kukreja. C.P. Tropical Architecture. Tata McGraw Hill Pub. Co. Ltd. New Delhi, 1978. Markus, T.A and Morris. E.N. Buildings. Climate and Energy, Pitman Pub Ltd., London, 1980.
3. Olgay and Olgay, Solar Control and Shading Devices.