COURSE TITLE : CLIMATOLOGY
COURSE CODE : 3029
COURSE CATEGORY : B
PERIODS/WEEK : 5
PERIODS/SEMESTER : 90
CREDITS : 4

TIME SCHEDULE

MODULE	TOPIC	PERIODS
I	Introduction on climatic factors The basic data for climatic design Classification of tropical climates Site climate	19
	Test I	1
II	Thermal comfort Site selection Thermal properties of materials	23
	Test II	1
III	Means of thermal control Mechanical control Structural control Ventilation and air movement	21
	Test III	1
IV	Shelter for hot-dry climate Shelter for warm humid climate Shelter for composite climate Shelter for tropical upland climate	23
	Test IV	1
	TOTAL	**90**

OBJECTIVES

MODULE-I

1.1 Understand the climatic factors
1.2 Understand global climatic factors
1.3 Outline elements of climate
1.4 Understand the characteristics of different types of tropical climate
1.5 Outline site climate

MODULE-II

2.1.1 Understand biological approach of climatic design
2.1.2 Understand the effect of climate on man
2.2.1 Translate site specifications for different tropical climates

2.2.2 Know thermal properties of materials

MODULE-III

3.0.0 Analyze different means of thermal control
3.1.1 Analyses of thermal control by mechanical mean
3.2.1 Analyses of thermal control by structural mean
3.3.1 Analyses of ventilation and air movement

MODULE-IV

4.0.0 Apply Climatology on design of shelters of different climate
4.1.1 Apply Climatology on design of shelters of Hot-dry climate
4.2.1 Apply Climatology on design of shelters of Warm-humid climate
4.3.1 Apply Climatology on design of shelters of Composite climate
4.4.1 Apply Climatology on design of shelters of Tropical climate

CONTENT DETAILS

MODULE-I

Climatology - definition, climate and weather, solar radiation quantity and quality, earth's thermal balance – winds – trade winds, mid-latitude, westerlies polar winds, annual wind shifts
Temperature - measurement –data, humidity – measurement data, precipitation, sky conditions – wind, measurements, data – solar radiation, measurement, data – other phenomenon- recording the climatic data – variation in climate
Classification of tropical climates – warm- humid climate, and island climate- hot –dry desert and maritime desert – climate- composite or monsoon climates, tropical upland climate
Site climate – Local factors, temperature, humidity ,sky conditions , solar radiation, Air movement ,precipitation – vegetation- urban climate – site climatic data

MODULE-II

Body's heat production, body's heat loss, regulatory mechanisms, body's heat balance- subjective variables – thermal indices -controlling factors – temperature, humidity, radiation, and air movement –ET, CET, Bio -climatic chart - comparison of climatic data with comfort requirements – Psychrometric chart

Site selection – effect of slope on solar radiation- effect of pollution, prevailing wind- recommendations for warm humid climate – recommendation for hot – dry climate – Recommendations for composite climates

Thermal properties of materials – absorption, conductivity, thermal capacity –transmittance, resistance of cavity, solar heat gain factor, periodic heat flow, decrement factor, time- lag, heat exchange of building

MODULE-III

Means of thermal control –objectives- mechanical controls – heating –problems associated with heating- ventilation – mechanical ventilation system – cooling by ventilation- cooling by evaporation– Mechanical cooling – dehumidification – Air conditioning systems –structural control, thermal Insulation and thermal capacity ,orientation – internal blinds and glasses, sun,s position- angle of incidence- shadow angles and devices- ventilation and air movement, functions, supply of fresh air, stack effect, wind effect, orientation, external features, cross ventilation, position, size and controll of openings, air flow around buildings ,humidity control

MODULE-IV

Shelter for hot – dry climate – nature of climate from and planning, roof, and wall and opening ventilation and airflow traditional shelter
Shelter for hot dry climate – the above-prescribed details
Shelter for warm humid – the above prescribed details
Shelter for composite – the above prescribed details
Shelter for upland climate – the above-prescribed details

REERENCE BOOK

1. Manual of Tropical Housing and Building : By Koenigsberger, Ingersoll, Mayhew and Szokolay
2. Climate Design
3. A text book of Refrigeration and air conditioning : R.S. Khurmi & J.K.Gupta
3.Environment Pollution - Management and control for sustainable Development : R.K. Khitoliya