Number of Units: 3.

Course description
This course introduces the student of architecture to the application of building climatology in architectural design. The introduction covers basic concepts and climatic data. The maintenance of thermal comfort by the human body in different climatic conditions is used to determine the design of sun-shading devices and choice of building materials and elements. The design of buildings for effective natural ventilation is introduced. Emphasis is on placed on the achievement of environmental control through the building fabric and design, especially by using design aids such as the Mahoney tables and climatic site analysis.

Course Content.
1. Basic concepts: Movement of the Earth around the sun, solar time, solar radiation, global wind pattern, and spatial systems of climate.
2. Climatic data: Collecting the data, dry bulb temperature, humidity, the psychrometric chart, vapour pressure, precipitation, wind, sky conditions, other phenomena, recording the data, and variations in climate.
4. Shading Devices: Types of shading devices, design of shading devices, overheated and under-heated periods, use of sun-path diagrams, the shadow angle protractor, and examples of shading devices. Case studies.
7. Air Conditioning: Basic concepts of air conditioning, thermal comfort and indoor air parameters, climate and outdoor air parameters, solar heat gain, cooling load, air conditioners, automatic regulation of air conditioning, air flow in conduits, ventilation, air filtration.
8. Climatic Site Analysis: Site analysis, the site climate, the form of dwellings.
9. The Mahoney Tables: The design process, the Mahoney tables, example of use of the Mahoney tables.
10. **Design in the Zones**: Climatic zones for architectural design, general design guidelines, design in the coastal zone, design in the forest zone, design in the transitional zone, design in the highland zone, design in the savannah zone, and design in the semi-desert zone. Case studies.

11. **Control of Tropical Microclimates through Landscape Design**: Concepts in microclimate control, objectives of microclimate control through landscaping, landscape elements for microclimate control, the design process, landscaping climatic data analysis, problems of microclimate control through landscaping.

12. **Use of Computers**: The need for computers, software for building climatology.

13. **Solar Design**: Basic concepts of solar design, conversion of solar energy, solar collectors, uses of solar energy, solar heating systems, solar cooling systems, design of solar buildings. Case studies.

14. **Sustainable Architecture**: Sustainable development, environmental, economic and social sustainability, sustainable design process and assessment, green code for architecture, environmental architecture, ecological building, green building, sustainable architectural and urban design, energy efficiency, water conservation, green features of building materials, waste management.

**Assessment**

- **Attendance**: 10%.
- **Assignment I**: 10% (Sun shading devices).
- **Assignment II**: 10% (Design in the Zones).
- **Assignment III**: 10% (Solar design and sustainability).
- **Examination**: 60%.

**Recommended reading**


Web sites.