

GUJARAT TECHNOLOGICAL UNIVERSITY
Syllabus for M. Arch - 2019
FIRST SEMESTER

Subject: Sustainable building Design principles –I

Course Code: X16102

Credits: 3

Course Objective: Principles of environmental science and building physics and human thermal comfort

Course Contents:

Global climate factors, elements of climate, classification of climate zones, desirable conditions, principals of thermal conditions and STI, body heat exchange, thermal balance, psychometric chart, sun path, sun angles ,SAP, sunshine hours, and solar noon, declination, extraterrestrial radiation, solar constant, radiation on different of different directions with different inclination of walls. Radiation spectrum, spectral sensitivity of eye, visual cone and comfort, daylight assessment, types of reflection, glare and quality and spread of light in buildings. Sound waves, audible range of sounds, equal loudness controls, noise reduction systems, sound transmission path. Thermal conductivity, emissivity, radiation, Reflectivity and convection. Density, specific heat, latent heat, thermal bridging, diffusivity, thermal insulation. Heat loss through common building elements due to transmission, R-values and U-values - imperial and SI units. Reduction Heat Transfer or Enhancement, insulation properties of materials and built forms. Radiation versus other Heat Transfer Methods

References:

1. Baird, George The architectural expression of environmental control systems
2. Faber, Oscar and Kell, J.R. Heating and air-conditioning of buildings. 2002.
3. Thomas, Randall & Fordham Max Sustainable urban design: an environmental approach” 2003.
4. Edwards, Brian and Hyett, Paul Rough guide to sustainability 2001.
5. Langston, Craig A. and Ding, Grace Sustainable practices in the built environment
6. Givoni Baruch, “Passive and Low Energy Cooling of Buildings”, VNR, New York, 1994.
7. Martin J Gainsborough, Radford and Helen Bennets, T J Williamson,
8. “Understanding Sustainable architecture”, Spon Press, London, 2003.
9. Kulbhushan Jain, Earth Architecture
10. National building Code of India (NBC)
11. Form, Space and Order – Francis D.K. Ching
12. Under the Banyans: Principles of sustainable habitats in the tropics ,Auroville