

GUJARAT TECHNOLOGICAL UNIVERSITY
Syllabus for B. Arch
SEMESTER - IX

SUBJECT NAME – ENERGY EFFICIENT ARCHITECTURE

SUBJECT CODE – 1095010

FOCUS:

- To inform the need to use alternative sources of energy in view of the depleting resources and Climate change.
- To familiarize the students with simple and passive design considerations
- To inform about the importance of day lighting and natural ventilation in building design
- To make the students aware of the future trends in creating sustainable built environment.

CONTENTS:

- Significance of Energy Efficiency in the contemporary context, Simple passive design Considerations involving Site Conditions, Building Orientation, Plan form and Building Envelope -
- Heat transfer and Thermal Performance of Walls and Roofs
- Direct Gain Thermal Storage of Wall and Roof - Roof Radiation Trap - Solarium - Isolated Gain
- Evaporative Cooling - Nocturnal Radiation cooling - Passive Desiccant Cooling – Induced Ventilation - Earth Sheltering - Wind Tower - Earth Air Tunnels
- Daylight Factor - Daylight Analysis - Daylight and Shading Devices - Types of Ventilation - Ventilation and Building Design.
- Areas for innovation in improving energy efficiency such as Photo Voltaic Cells, Battery Technology, Thermal Energy Storage, Recycled and Reusable Building materials, Nanotechnology, smart materials and the future of built environment, Energy Conservation Building code.

SUGGESTED BOOKS

- Manual on Solar Passive Architecture, IIT Mumbai and Mines New Delhi, 1999
- Arvind Krishnan & Others, “Climate Responsive Architecture”, A Design Handbook for
- Energy Efficient Buildings, TATA McGraw Hill Publishing Company Limited, New Delhi, 2001
- Majumdar M, “Energy-efficient Building in India”, TERI Press, 2000.

- Givoni .B, “Passive and Low Energy Cooling of Buildings”, Van Nostrand Reinhold, New York, 1994
- Fuller Moore, “Environmental Control Systems”, McGraw Hill INC, New Delhi - 1993
- Sophia and Stefan Behling, Sol power, “The Evolution of Solar Architecture”, Prestel, New York, 1996
- Patrick Waterfield, “The Energy Efficient Home: A Complete Guide”, Crowood press ltd, 2011.
- Dean Hawkes, “Energy Efficient Buildings: Architecture, Engineering and Environment”, W.W. Norton & Company, 2002
- David Johnson, Scott Gibson, “Green from the Ground Up: Sustainable, Healthy and Energy efficient home construction”, Taunton Press, 2008