M.Sc. in Smart Control Systems for Energy Management

Course Structure

Course Code :   **SM7105**

Course Title :   **Smart Facility Planning Systems**

Credit Hours :   **3**

Course Description

Site planning, workplace programming and space allocation, sustainable design, solar irradiation, comfort and controls, facility management, design process and tools, building performance optimization, load matching, grid interaction and control.

Course Objectives

The student should become acquainted with:
- To present the overall planning process for smart facilities including space planning, facilities layout, engineering systems in an integrated manor along with different modelling and simulation approaches.

Course Topics

- Introduction, course structure, textbooks and recommended books, grading. Main aspects of a smart and energy efficient facility.
- Site planning, choosing allocation, material handling and flow, logistics, area measurement standards.
- Workplace programming and space allocation.\sustainable design.
- Solar irradiation and thermal storage and modelling.
- Comfort and control: thermal acoustic and visual comfort and strategies and controls for maximizing the comfort factor.
- Computer aided facilities management building intelligence and smart system information systems management
- Design process and tools
- Building performance optimization. Introduction and optimization fundamentals
- Building performance optimization: applications.
- Building performance optimization: case study and conclusion
- Load matching, grid interaction and advanced control. Development of load matching and strategies for control and load management.
- Case studies of smart facilities.

References
- Facilities Planning: principles, technology, Guidelines Jeffrey E. Clark 2008.
- Pearson Prentice Hall. ISBN: 9780131149366
- "Modelling, Design and Optimization of net-zero energy buildings (solar heating and cooling)" by A. Athienitis and W. O'brien 2015.