

## About IIIT

IIIT Hyderabad is an autonomous, self-supporting institution started in 1998. The major goal of IIIT is to impart a uniquely broad and interdisciplinary IT education of the highest academic quality. This is achieved through an integrated curriculum that consists of a highly diverse set of IT courses; inter disciplinary IT research projects, day-to-day interaction with industry, preparation in entrepreneurship and personality development courses. The institute offers Undergraduate, Postgraduate and Doctoral level programmes in IT, Electronics and Communications, and applications of IT in various domains. The institute is carrying out advanced Research and Development in Information and Software Technologies and their societal, scientific, industrial and financial applications.

## About CBS

The centre for IT in Building Science aims at developing and spreading the betterment of buildings in terms of products, processes and performances. CBS emphasizes on studying, applying and improving various IT tools for visualization, optimization, thermal, illumination and acoustic modeling.

## COURSE FACULTY

### Vishal Garg

**Dr. Vishal Garg** is a civil engineer from University of Jodhpur and Ph.D. from Centre for Energy Studies in IIT Delhi. Currently he is head, Center for IT in Building Science and Associate Professor at IIIT Hyderabad. He has worked on fiber optic based lighting, fuzzy logic based task control of lighting and heating, and venetian blind control. His current research interests are energy simulation, cool roofs and outcome based energy codes. Along with research, he is involved in teaching Building Automation & Controls, Intelligent Buildings, Energy Simulation, Lighting Design & Technology. He is founder president of IBPSA, India chapter.



### Jyotirmay Mathur

**Dr.-Ing. Jyotirmay Mathur** is a mechanical engineer from University of Jodhpur, postgraduate in energy studies from IIT Delhi and doctorate from Germany. He specializes in the areas of energy efficiency, solar passive concepts. He has worked on several national / international



cycle assessment, development of solar chimney and wind tower for ventilation in buildings. He has published 20 papers in research journals and presented 45 papers in national / international conferences and edited five books. He is teaching courses on renewable energy sources, energy conservation, energy and environment as Associate Professor in the Mechanical Engineering Department and working as Coordinator of the Centre for Energy and Environment at MNIT Jaipur.

### S. Srinivas

**S. Srinivas** is a Principal Counselor and heads the Green Building division of CII-Sohrabji Godrej Green Business Centre, Hyderabad, India. He is a LEED Accredited Professional, trained LEED Faculty and Assessor. He has helped more than 110 projects in incorporating green designs in building construction. He has conducted more than 150 training programmes on green buildings all over the country and in UAE (Dubai and Abu Dhabi). He has worked on several International projects with bilateral agencies. He is a key member working on the green building rating systems and certification



### Tools Used

eQUEST, Visual DOE, DIALUX, Ecotect, Radiance.

### Pre-Requisites

Good understanding of various services in buildings especially illumination and HVAC, familiarity with CAD and office applications. Participants should bring their own laptops with the following tools installed eQUEST (free tool available at : <http://www.doe2.com/equest/>), DIALUX (free tool available at:<http://www.dialux.com/>), and Ecotect (evaluation version available at: <http://www.autodesk.com/ecotect-analysis>). It is also expected that office suite, DXF and DWG viewer and PDF viewer are also installed.

### Contact :

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Continuing Education Programme

**CENTRE FOR IT IN BUILDING SCIENCE  
(CBS)**

At



**International Institute of Information Technology**

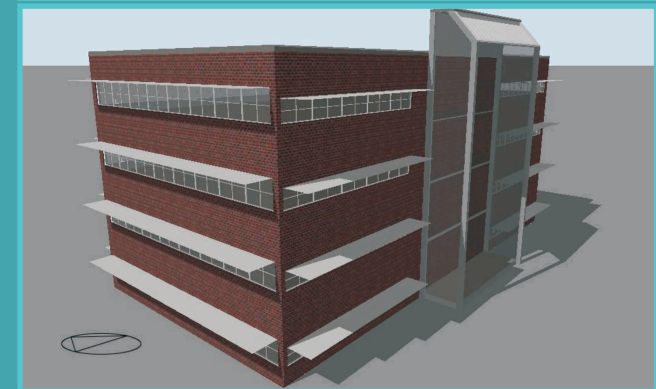
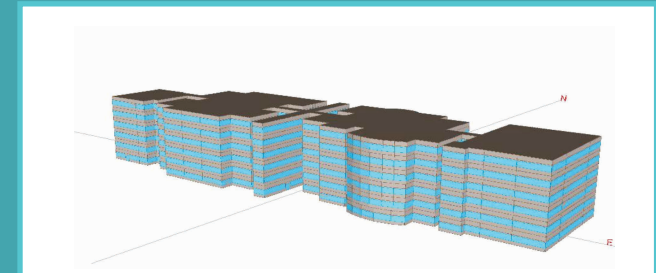
Hyderabad

**Announces**

**International  
Training Programme**

on

**Energy Simulation of Buildings for  
LEED and ECBC**



## About the course

Introduction of LEED-India and launch of Energy Conservation Building Code (ECBC) are the two major milestones in constructing green and energy efficient India through the building sector. Since LEED-India has a major focus on energy efficiency in buildings, one of the major challenges in front of designers trying to obtain LEED rating is to ensure the level of energy efficiency. The ECBC is voluntary at this stage but is likely to be mandatory for commercial buildings in near future. Both these systems demand the upcoming buildings to be more efficient as compared to standard buildings of same shape and usage. Comparison of proposed designs with base case / standard case can be carried out by use of energy simulation tools. Building energy simulation tools provide facility to embed energy efficiency in buildings by predicting their behavior under given climatic conditions and usage patterns. These tools help to predict energy consumption in buildings and provide opportunity to compare different design options through techno-economic analysis. Decisions related to use of insulation on roof, advanced glazing, high performance HVAC system can be taken with much elevated confidence level. This four day workshop is, therefore, a unique opportunity of its kind to learn how to perform energy simulation of buildings for LEED and ECBC through hands-on training on simulation tools and case studies. Besides sailing through the process of building energy simulation up to report preparation stage, the workshop would also cover fundamental concepts required to utilize these simulation tools in the best possible ways. This course addresses the skills and knowledge requirements for carrying out energy simulations for LEED and ECBC. Some common question such as – how much detailing is required for energy modeling; what are the impacts of lighting, internal loads, occupancy schedules; how to analyze simulation results and propose energy conservation measure (ECMs), how to rank ECMs on life cycle cost; would be answered through interactive exercises.

## Course Outline

The four day intensive programme explores the following topics through concept building lectures and hands on simulation exercises:

### Day 1 : (0930 – 1730 hours)

#### Overview of building from energy perspective

- What is a building from energy perspective?
- Heat transfer in building, internal gains, U and R value, thermal storage, SHGC, Lighting Power Density
- Parameters affecting building performance
- Composition of annual energy consumption – internal load, lighting, conductive gain, radiative cooling
- Target values for cooling, lighting, overall performance
- Tools of the trade

#### Planning for building energy simulation

- Creating a Simple building
- Zoning
- Material properties
- Building usage, defining schedules and loads
- Location, climate data (understanding the data, degree day, design day)
- Creating two zone building geometry
- Simulation and results
- Parametric analysis

### Day 2 : (0900-1700 hours)

#### LEED/ECBC requirements

- Salient features and mandatory requirements for LEED/ECBC
- Creating standard building as per ASHRAE 90.1/ECBC, real life project
- Discussion on common mistakes, cross-checking, tricks for simplification of model

#### Solar Exposure of buildings, day-lighting and artificial lighting

- Introduction to daylight
- Daylight simulation using radiance
- Simulation and results

### Day 3 : (0900-1700 hours)

#### Analysis using simulation

- Creating 'As is' case model
- Generation of ECMs
- Passive ECMs
- Comparison of Base case, 'As is' case and ECMs

#### Compliance checking and report preparation

- LEED/ECBC templates
- Preparation of report

### Day 4 : (0900 – 1600 hours)

#### Working on a project

- Understanding the project
- Importing the drawings in Energy Simulation Software
- Creating the ASHRAE baseline model
- Creating the AS IS model and comparing it with baseline model energy consumption
- Working on various energy conservation measures
- Selecting the ECMs on the basis of Life Cycle Costs
- Preparation of final proposed case
- Performing the daylighting and light pollution simulations
- Documentation and Filling templates for LEED

