

3-DAY-CERTIFICATE COURSE ON VISUAL COMFORT, DAY LIGHTING AND ARTIFICIAL LIGHTING WITH MODELLING AND SIMULATION



19th, 20th & 21st September 2020

Energy Management Centre Kerala
Srikrishna Nagar, Sreekaryam
Thiruvananthapuram- 695017,
Kerala, India

BACKGROUND

Global climate change concerns have been the focus of governments, businesses and institutions for over two decades now. The growth and development of our communities has a large impact on our natural environment. Economic growth has resulted in unreliable power supply and increased costs of energy. In this context, the adoption of green buildings, energy efficiency measures, and renewable energy has become a necessity. Green building, or sustainable design, is the practice of increasing the efficiency with which buildings and their sites use energy, water, and materials, and reducing building impacts on human health and the environment over the entire life cycle of the building. Green building concepts extend beyond the walls of buildings and can include site planning, community and land use planning issues as well. Energy efficiency means using less energy to accomplish the same task. Improving our energy efficiency is the first and most important step toward adopting renewable energy as well. The more efficient use of energy throughout our country results in less money spent on energy by homeowners, schools, government agencies, businesses, and industries. By using specialized lighting and building design practices we can contribute to an energy efficient economy.

ABOUT EMC

Energy Management Centre (EMC), Dept. of Power, Govt. of Kerala, the first state level organization exclusively for promoting energy conservation came into existence on 07.02.1996. In exercise of power conferred by clause(d) of section 15 of Energy Conservation Act 2001(Central Act 52 of 2002) Energy Management Centre - Kerala (EMC), is designated as the State Designated Agency (SDA) of Bureau of Energy Efficiency, Ministry of Power, Government of India to coordinate, enforce and implement Energy Conservation Act 2001 (Central Act 52 of 2002) in 2003. The Centre is devoted to the improvement of energy efficiency in all sectors of economy in the State through promotion of energy conservation and encouraging development of technologies related to energy through demonstration programmes, research, training, and awareness creation.

ENERGY MANAGEMENT INSTITUTE

Energy Management Institute is an academic institution functioning under Energy Management Centre to design, coordinate and deliver various courses on Energy Management, Energy Efficiency and skill development programs.

WHY TRAINING PROGRAM

Designing green buildings is a task that has two components. The first, a strong foundation in the

- Science
- Codes
- Standards and
- Guidelines

that apply to the design, construction and occupancy of such buildings; and the second, application of software tools that help apply all the theory in a 'relatively' easy manner.

The theory and software part can be mutually exclusive so some participants can focus on passive architecture and complementary software, some on illumination engineering and its complementary software, and some on space conditioning and its complementary software.

This leaves the course flexible, allows the participants to customize the program to suit their specific needs, and caters to a wider spectrum of participants



COURSE OBJECTIVES

- To help in Human Resource capacity building, providing key technical information and leading to more optimum decision making support knowledge towards the implementation of energy efficient and green habitats.
- To provide information and skills on software for lighting and energy systems design
- To provide information and skills on visual comfort and thermal comfort for sustainable habitat design.
- To provide information about sustainable/alternative construction materials
- To provide information and skills on social sustainability and its application in settlement-level green developments
- To provide information and skills on Green building rating systems

EXPECTED OUTCOMES & JOB OPPORTUNITIES

- After attending the course, participants will be able to understand and readily apply concepts of visual comfort, software basics to design lighting and optimize the energy consumed by lighting.
- Job opportunities in lighting design, green building sector, etc.

COURSE METHODOLOGY

- Expert-led sessions focused on lighting design.
- Participants will receive lectures, participate in group-based case study analyses and engage in worksheet calculations and analyses.

BRIEF DESCRIPTION OF THE COURSE

DAY 1 & 2

- Presentation on concepts of visual comfort, day lighting and artificial lighting & case studies. (2 Hours).
- Introduction to Ecotect modeling and simulation for daylight integration. And assistance in creating shading devices, studying shadow profiles, and the like. (8 Hours).

DAY 3

- Introduction to DIALux Modeling and simulation for optimization of artificial lighting, rendering of lighting scenes and compilation of design report. (3 Hours).
- Short assignment/ exercise/ test (2 Hours).

COURSE COVERAGE

Basic Theory

1. Visual Comfort
 - i) Fundamentals of Human Visual Comfort
 - ii) Effective natural lighting systems
 - iii) Effective artificial lighting system
 - iv) Day-light harvesting or artificial lighting integration
2. Indian National Codes (ECBC, NBC, SP-41) and rating systems contributing to sustainable habitats and other green developments

Software Suits

Some globally accepted software suites that are specific to sustainable building design are as follows:

- Ecotect Suite (Proprietary, but not available any more)
- Desktop Radiance (Open Source)
- DAYSIM (Open Source)
- Relux/ DIALux (Open Source)



AGENDA

DAY 1

Session 1 Introduction

10:30-12:30 Ice breaking session: Brush-up on concepts of visual comfort, daylighting and artificial lighting using case studies

12:30-14:00 Lunch break

Session - 2 Daylight - The session deals with optimizing the building design for daylighting. The intent of session on visual comfort is to familiarize participants with two broad parameters; namely the basics of solar passive building design and the quantitative analysis.

14:00-17:00 Introduction to Ecotect modeling and simulation for daylight integration using Radiance/Dayism. And assistance in creating shading devices, studying shadow profiles, and the like. The daylighting basics will be covered simultaneously with hands-on application.

Day - 2

10:00-10:30 **Question & answer. Discussion on Day 1 queries and thoughts**

10:30-12:30 Session 2 continue.

12:30-14:00 Lunch break

14:00-17:00 Session 2 continue.

Day - 3

10:00-10:30 **Question & answer. Discussion on Day 2 queries and thoughts**

Session 3 Artificial Lighting - The session deals with optimizing the artificial lighting layout for maximum efficiency and occupant comfort. The intent of session on visual comfort is to familiarize participants with assessing the illumination levels.

10:30-13:30 Introduction to DIALux modeling and simulation for optimization of artificial lighting, rendering of lighting scenes and compilation of design report. The artificial lighting basics will be covered simultaneously with hands-on application.

13:30-15:00 Lunch break

15:00-17:00 Short exercise/assignment



WHO CAN ATTEND

The course is mainly intended for:

- Those who are interested in day lighting, artificial lighting, day light integration, shadow profile etc.
- Students- B.Tech/ M.Tech/ B. Arch/ B.Sc Optics etc.
- Faculty/research scholars working in engineering /technical institutions/ organizations.
- Interested working professionals.

REGISTRATION PROCESS

Registration has to done online

<https://forms.gle/Z8dSsbsA7CWIRpiw5>

Registration Fee:

Students: Rs. 2000/-

Faculty and research scholars: Rs. 2500/-

Working professionals: Rs. 2500/-

Foreign delegate: Rs. 5000/-

The payment shall be made to Energy Management Centre online to the following account and the transaction details has to be sent to the email: rajeev@keralaenergy.gov.in

Account details

Account Name: Energy Management Centre

Account No: 67084840014

Bank & Branch: State Bank of India, Engineering College Branch

IFSC Code: SBIN0070268

ADDRESS FOR CORRESPONDENCE

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