

L E A R N F R O M B E Y O N D S M A R T C I T I E S

KNOWLEDGE IS POWER



BEYOND
SMART CITIES

L E A R N . B E Y O N D S M A R T C I T I E S . I N



wel come to

BEYOND SMART CITIES



CERTIFIED LIGHTING EFFICIENCY PROFESSIONAL CLEP OVERVIEW

ONLINE PROFESSIONAL COURSES LED BY THE WORLD'S TOP SPECIALISTS

ONLINE TRAINING BY KRISHNAJI PAWAR

LEED AP(BD+C), GSAS CGP, GCP, ISO 14001

LEARN.BEYONDSMARTCITIES.IN

KNOWLEDGE IS POWER

BEYOND
SMART CITIES

MODULE

1

Introduction and Course Outline

KRISHNAJI PAWAR - CEO & FOUNDER

LEED AP(BD+C),GSAS CGP,GCP,ISO 14001

WWW.BEYONDSMARTCITIES.IN





BRIEF ABOUT ME

Krishnaji PAWAR

CEO & FOUNDER

Krishnaji Pawar is founder and CEO of Beyond Smart Cities. Before being named CEO in January 2020, Krishnaji held leadership roles at Beyond Smart Cities in both Sustainability ,Energy & Environmental Consultancy.

Specialized in developing sustainable design strategies for Green Building Certification Systems (LEED, GSAS, etc.), Energy & Water Conservation, Commissioning, Environmental Impact Assessment & Environmental Management Systems.

Currently responsible for 3,787 million square feet Green Building /Energy modeling Consulting since January 2008 in UAE, India and Qatar.





CERTIFIED LIGHTING EFFICIENCY PROFESSIONAL CLEP OVERVIEW

The U.S. building sector accounted for over 40% of primary energy consumption in 2010, with lighting accounting for 10% and 17.4% of this. Reducing energy use can have economic, environmental, and political benefits. To achieve this, lighting designers, architects, and engineers should use Quality Lighting for High Performance Buildings to specify energy-efficient, sustainable, and visually comfortable systems.

Learning Objectives

- **Introduction and Course Outline**
- **Quality Lighting for High-Performance Buildings**
- **LED Technology & its Operating Characteristics**
- **Lighting Quantity and Quality Fundamentals**
- **Lighting and control system maintenance and commissioning.**
- **Environmental Concerns**
- **Certified Lighting Efficiency Specialist Certification**
- **Summary and Resources**
- **CLEP Practice Test V.4.1_Test Your Knowledge**



INTRODUCTION

- The U.S. building sector accounted for over 40% of primary energy consumption in 2010.
- Lighting accounted for 10% of this usage in homes and 17.4% in commercial buildings.
- Reducing energy use can lead to economic, environmental, and political benefits.
- Quality Lighting for High Performance Buildings is recommended for lighting designers, architects, and engineers.
- AEE's Certified Lighting Efficiency Professional (CLEP) program recognizes leaders in lighting efficiency.
- CLEPs understand building's lighting requirements and evaluate lighting efficiency projects.
- The CLEP Overview training program provides essential skills, knowledge, tools, credentials, and practice exam questions for the CLEP Exam Knowledge Domains.

CERTIFIED LIGHTING EFFICIENCY PROFESSIONAL (CLEP) OVERVIEW

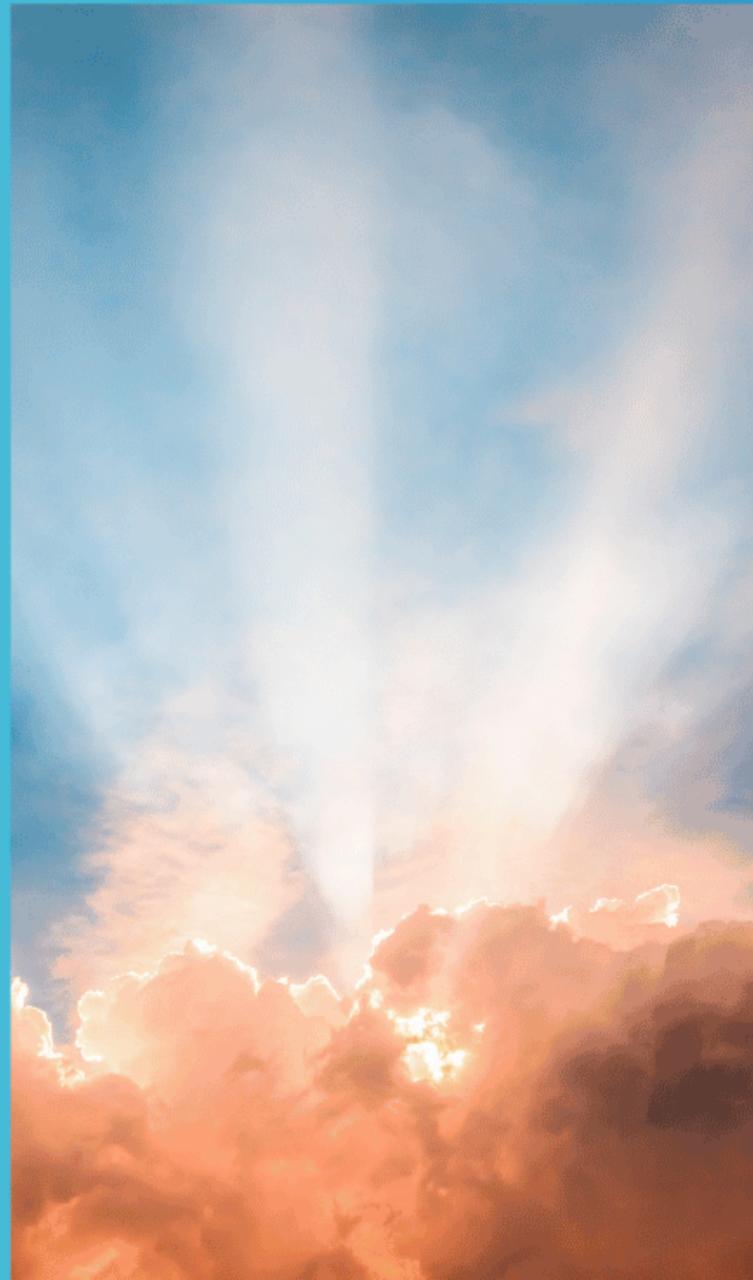
- The CLEP certification is offered by the Association of Energy Engineers (AEE) to professionals in lighting design, energy efficiency, and sustainability.
- The certification aims to establish a standard of competency in the lighting industry, promoting energy-efficient practices that reduce energy costs, lower carbon footprints, and enhance occupant satisfaction.
- Eligibility requirements include a degree in engineering, architecture, environmental science, or a related field, at least two years of working experience in the lighting industry, and ongoing professional development through continuing education courses or training programs.





CERTIFIED LIGHTING EFFICIENCY PROFESSIONAL (CLEP) OVERVIEW +

- The CLEP examination covers Lighting Fundamentals, Lighting Technologies, Energy Codes and Standards, Lighting Design and Application, and Energy Audits and Assessments.
- Practical applications of the CLEP certification include retrofitting existing systems, designing new installations, and conducting training and workshops.
- The certification's significance extends beyond individual professionals to broader societal implications, such as reducing energy consumption and mitigating climate change impacts.
- The transition to energy-efficient lighting can also have significant economic benefits, allowing communities and organizations to invest in other crucial areas like infrastructure development or community programs.



UNDERSTANDING THE HUMAN VISUAL SYSTEM (ELS)

Key Terminology:

- **Photoreceptors:** Specialized cells in the retina that detect light.
- **Visual Acuity:** The clarity or sharpness of vision, typically measured by the ability to discern fine details.
- **Color Perception:** The ability to distinguish different wavelengths of light, which our brains interpret as colors.
- **Contrast Sensitivity:** The ability to detect differences in luminance between an object and its background.
- **Luminance:** A measure of the amount of light emitted, reflected, or transmitted from a surface in a given direction.



LIGHT PERCEPTION AND THE VISUAL PROCESS +

- Light enters the eye through the cornea, which refracts the light to focus it onto the retina.
- The retina contains photoreceptors that convert light into electrical signals.
- The optic nerve then transmits these signals to the brain, which interprets them as visual images.

Role of the Retina:

- The retina plays a crucial role in light perception.
- The retina unevenly distributes rods and cones, with a high concentration of cones in the fovea for sharp central vision and rods more numerous in the peripheral regions for motion detection and night vision.



NEURAL PROCESSING OF LIGHT +

- Various layers of neurons within the retina process the electrical signals that the photoreceptors convert into before sending them to the brain.
- This hierarchical processing is essential for creating a coherent visual representation from the multitude of signals generated by photoreceptors.

Visibility Factors:

- Physical Environment: Surface Reflectance and Background Contrast: High reflectance surfaces are more visible than low reflectance surfaces under the same lighting conditions.
- Observer Characteristics: Age and adaptation: The human visual system adapts to varying light conditions.
- Lighting Conditions: Illuminance and Light Quality: The spectrum of light also matters.



TRADITIONAL LIGHT SOURCES: TERMINOLOGY, TYPES, AND USE ANALYSIS

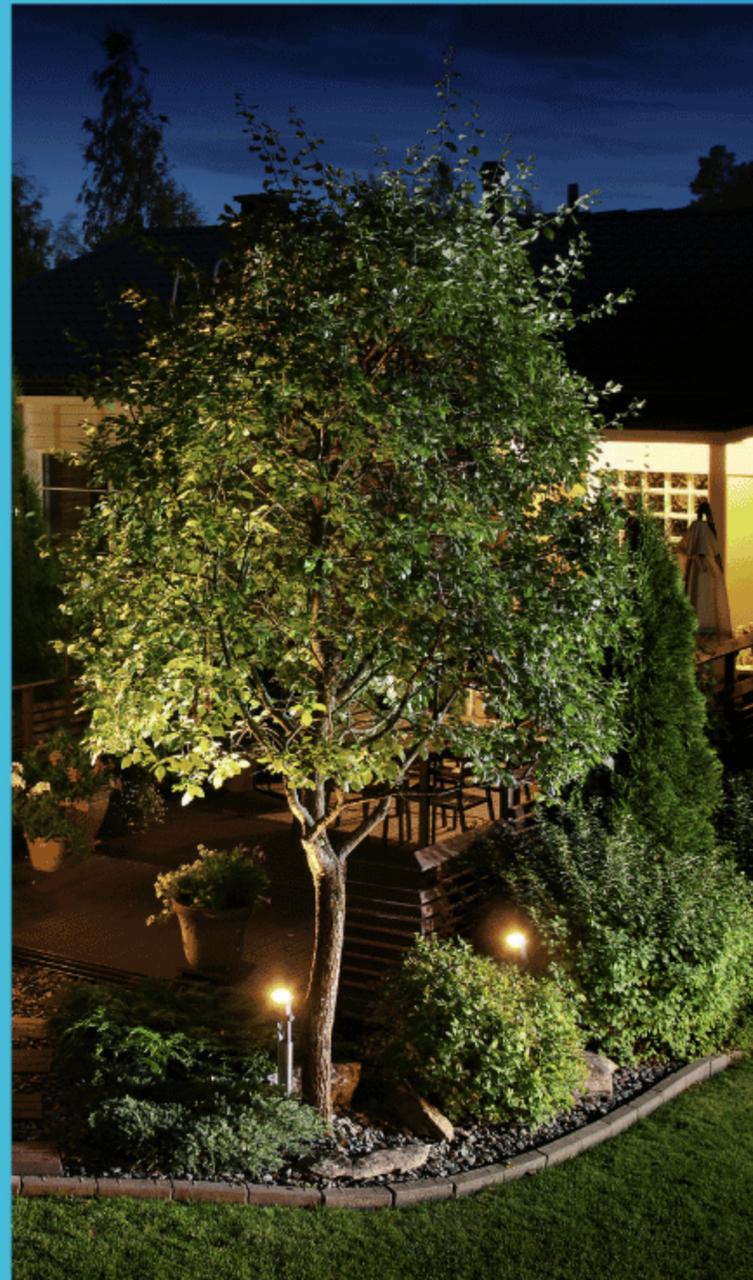
Terminology of Lamps

- Luminous Flux (Lumens): Refers to the total amount of visible light emitted by a source per unit of time.
- Luminous Efficacy: Measures the efficiency of a light source in converting electrical power into luminous flux.
- Color Temperature: Measures the color appearance of the light produced by a lamp.
- CRI (Color Rendering Index): Measures a lamp's ability to accurately render colors compared to a natural light source.
- Lifespan: Refers to the duration a lamp can operate before the light output significantly diminishes or fails.





TRADITIONAL LIGHT SOURCES: TERMINOLOGY, TYPES, AND USE ANALYSIS + Types of Lamps



- Incandescent Lamps: Widely used in residential settings for ambient lighting due to their warm color temperature and high CRI.
- Halogen Lamps: Contains a halogen gas, allowing for higher efficiency and longer lifespan.
- Fluorescent Lamps: Produce light through the excitation of mercury vapor, emitting ultraviolet light that excites a phosphor coating inside the lamp.
- Compact Fluorescent Lamps (CFLs): Used in residential and commercial settings as a more energy-efficient alternative to incandescent bulbs.
- High-Intensity Discharge (HID) Lamps: Commonly used in outdoor lighting, streetlights, and industrial applications where high levels of illumination are required.

TRADITIONAL LIGHT SOURCES: TERMINOLOGY, TYPES, AND USE ANALYSIS ++

Use Analysis of Traditional Lamps

- Residential Applications: Preference for incandescent lamps has shifted towards energy-efficient options like CFLs and LEDs.
- Commercial Applications: Fluorescent and HID lamps dominate in commercial environments due to their ability to deliver high output while minimizing energy costs.
- Aesthetic Considerations: Lighting's aesthetic qualities are critical in design.



ENERGY EFFICIENCY AND CLIMATE CHANGE MITIGATION



- Energy efficiency is crucial in mitigating climate change by reducing greenhouse gas emissions, lowering energy consumption, and promoting sustainable development.
- It is expressed as a ratio of useful output to energy input, with LED light bulbs converting 80% of energy into light.
- Energy efficiency impacts climate change by reducing GHG emissions, reducing the need for fossil fuel extraction and combustion.
- Energy-efficient technologies in buildings can reduce energy consumption by 30% to 50%, lowering GHG emissions proportionately.
- Improving energy efficiency offers substantial economic benefits, with savings on energy bills often outweighing the cost of energy efficiency measures.
- Governments and regulatory bodies worldwide recognize the importance of energy efficiency in their climate action strategies, with policies such as energy efficiency standards, tax incentives, and funding for energy-efficient technologies.
- Future efforts must focus on overcoming existing barriers, integrating smart technologies and the Internet of Things (IoT) for real-time monitoring and optimization of energy use.



WELCOME TO BEYOND SMART CITIES

Beyond Smart Cities is the world's 1st Green Technology Marketplace, connecting millions of Sustainability Specialists, Green Building Specialists, Energy Specialists, Commissioning Specialists, Environment Specialists, Health & Safety Specialists, Fire Safety Specialists, Climate Change Specialists & Green Products/Technology Manufacturers with independent talent around the globe.

Our mission is to build and support a global community of experts with the highest professional standards in sustainability, green building, energy, commissioning, environment, health & safety, fire safety, climate change, GHG accounting, carbon auditing, and GHG emissions management.



CONTACT US



+91 6363032722



info@beyondsmartcities.in



learn.beyondsmartcities.in



#55,HMR Layout ,Bengaluru ,India



THANK YOU

