

# AMEL23 ILLUMINATION ENGINEERING

## UNIT-1 LIGHT, SIGHT & COLOUR

- 1.1 Electromagnetic radiation, Laws of radiation, Light flux, Light intensity, illuminance laws, Luminance, Surface reflectance, Structure of the eye, photopic,
- 1.2 Mesopic and scotopic vision, trichromatism, perception details, visual performance, adaptation, flicker, glare,
- 1.3 Perception of objects and spaces, photocell, lighting measurement, Physics of colour, colour mixing, colour appearance,
- 1.4 Colour temperature, surface colours, colour rendering & rendition index.

## UNIT-2 LAMPS AND ACCESSORIES

- 2.1 Light production by gas discharge, fluorescence, incandescence, daylight principle of operation, light efficacy, colour, electrical characteristics, typical applications,
- 2.2 Dimming condition of GLS filament, tungsten halogen lamps, fluorescent tubes, compact fluorescent lamp (cfl),
- 2.3 Low and high pressure sodium lamps, high pressure mercury lamp, metal halide lamp.

## UNIT-3 LUMINARIES

- 3.1 Functions of luminaries, classification, Materials Used in luminaries manufacturing, reflection, refraction, diffusion, polarization and optical design,
- 3.2 Photometric measurements, application data and its use.

## UNIT-4. INTERIOR LIGHTING

- 4.1 Objectives quantity and quality of light, selection of lamps, luminaries section, placement.
- 4.2 Design considerations for lighting of offices, conference rooms, hospitals, teaching places, house, hotels, art galleries, museums, shops, shopping centres, temples factories etc.,
- 4.3 Design calculations.

## UNIT-5 EXTERIOR LIGHTING DESIGN

- 5.1 Exterior lighting objectives, choice of lamps type, luminaries, lighting of parks and gardens, pathways, outdoor work areas.
- 5.2 Lamps and luminaries photometric data and its use in design calculation, glare consideration.

## UNIT-6 ROAD LIGHTING

- 6.1 Aims of road lighting, quantitative and qualitative lighting needs, luminance concept, road reflection characteristics, light sources, luminaries, road lighting design calculations,
- 6.2 Sliting of luminaries on straight roads, junctions, and special situations, esthetics, maintenance, lighting for residential colony road lighting,
- 6.3 Tunnel lighting design requirements and criteria. High mast lighting for roads.

## UNIT-7 UTILITY AREA LIGHTING

- 7.1 Objectives of utility area lighting, lighting for marshalling yards, outdoor working and storage areas, container terminals, airport aprons, docks and harbors etc.,
- 7.2 Ask analysis and considerations for lighting parameters and design.

### **UNIT-8 SPORTS LIGHTING**

- 8.1 Indoor and outdoor games, lighting parameter requirements for players, TV cameras, horizontal and vertical luminance, glare limitation, level of competition, light sources, location of luminaries.

### **UNIT-9 DECORATIVE FLOOD LIGHTING**

- 3.1 Introduction to the principle of decorative building flood lighting, consideration for the shape and form, selection of lamps and luminaries, design criteria.

### **UNIT-10 EMERGENCY LIGHTING**

- 10.1 Regulations standards and its requirements, escape lighting, standby system.

### **UNIT-11 LIGHTING CONTROLS**

- 11.1 Types of lighting controls, strategy for selection, benefits of lighting control.

### **UNIT-12 DISTRIBUTION OF SYSTEM AND MAINTENANCE**

- 12.1 Electric distribution system for lighting, maintenance strategies, group replacement schedule.

### **UNIT-13 ENERGY EFFICIENT LIGHTING DESIGN AND COMPUTER AIDED LIGHTING DESIGN**

- 13.1 Techniques of achieving energy efficient lighting design, role of computers in lighting design, advantages and limitations of computer aided lighting design.

#### **Reference Book:**

1. Electric Power and electric Traction, Publisher Katsons, Writer J B Gupta