Annexure I

Detailed Curriculum

Chapter 1 : Introduction to Light Sources and their characteristics

* + Introduction, Light sources
  + Types of lighting sources
  + Characteristics of light sources
  + Measurement of Light - Light units
  + Light emitting diode (LED)
  + Working of LED
  + Different Types of LED’s available
  + Behaviour of LEDs with Junction temperature
  + Connection of multiple LEDs
  + White light production from LEDs
  + Assignment
  + Practical Competencies

Chapter-2 : Comparative study of LED and other light sources

* + Introduction, Calculation of current in the use of LEDs
  + Basic ideas for reliability:
  + Mains operated LED Lamp
  + General principle of working of LED flash light
  + Working principle of USB light
  + Replacement of incandescent bulb and CFL by LED light
  + Quality of white LEDs
  + Quality of LED lamps
  + Calculation of efficiency of light sources
  + Benefits of LED light bulbs
  + Assignment
  + Practical’s to be performed

Chapter-3 : Design and Assembly of LED based products

* + Introduction, Design of constant current drive circuits
  + Calculation of power consumption
  + Mechanical parts and Assembly of LED based lighting products
  + Riveting, Potting material, Insulating tape
  + Heat shrink tubing
  + PCB Cleaning, Significance of optics
  + Tools required in process control
  + Electro-Static Discharge (ESD) and work safety precautions
  + IP Rating, 5S standards
  + Handling and disposal of hazardous material
  + Assignment
  + Practical Competencies

Chapter-4 : Introduction of renewable energy & study of characteristics of SPV cells

* + Introduction, Introduction to solar energy as renewable source
  + Historical perspective of using solar energy
  + Concept of solar photovoltaic cells (SPV)
  + Basic principle & working of SPV’s
  + Rating & specifications of SPV peak voltage and voltage/ current on load
  + Types of solar photovoltaic cells (SPV)
  + Solar PV systems
  + Area of SPV & Energy
  + SPV efficiency
  + Battery Charge Controllers
  + Wiring of Solar Panels and Batteries
  + Storage battery size & autonomy of SPV system
  + Solar system components
  + Inverter
  + Balance of System
  + Assembly of SPV chargeable Light Source - Solar Lamp
  + Assignment
  + Practical Competencies

Chapter-5 : Installation and Maintenance of Solar Panel

* + Introduction, Tools involved in installation of system
  + Occupational health and safety standards and waste management procedures
  + Precautions to be taken while installation
  + Solar PV system sizing
  + Site surveying methods and evaluation parameters
  + Evaluation parameters
  + Sunlight and direction assessment
  + Assembly and placement of solar panel mounting
  + Installation of solar plates on holding clamp
  + Wiring multiple PV modules
  + Wiring of solar panel to inverter
  + Maintenance of solar panels
  + Assignments
  + Practical Competencies