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