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Illumination Practices — Complete Syllabus (Program Elective-4, Option 2)

BTEUP Diploma in Electrical Engineering • 5th Semester • Session 2026-27
Subject 5.4.2 (Program Elective-4, Practicum) • Total 100 Marks • 3 Credits • L 1 – P 4 •
Choose this OR Electrical Testing and Commissioning

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
5.4	Program Elective-4: Illumination Practices	Practicum	1 - 4	3	60	40 (3 hrs)	100
Illumination Practices Total				3	60	40	100

What This Subject Aims To Do

To help students design illumination schemes and the associated electrification of buildings.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
I	Fundamentals of illumination	2	18%
II	Types of lamps	3	22%
III	Illumination Control and Control Circuits	4	22%
IV	Illumination for Interior Applications	2	16%

V	Illumination for Other Applications	3	22%
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Unit - I: Fundamentals of illumination (2 Periods, 18%)

Topics: Basic illumination, Terminology, Laws of illumination, Concept of Photometry, Measurement of illumination; Lighting calculation methods, Watt / m² method, Lumens or light flux method, Point to point method.

Unit - II: Types of lamps (3 Periods, 22%)

Topics: Incandescent lamp, ARC lamps – AC and DC arc lamps, fluorescent lamp; Types of other lamps: Mercury vapour lamp, HPMV lamp, Mercury iodide lamp, Sodium vapour lamp, Halogen Lamps, Ultraviolet Lamps, Neon Lamps; Neon Sign Tubes; Metal halides, HID and Arc lamps, LED lamps, CFL.

Unit - III: Illumination Control and Control Circuits (4 Periods, 22%)

Topics: Purpose of lighting control and Dimmer, Dimmer Transformer, Auto transformer dimmer, Two winding transformer dimmer; Electronic Dimmer: working principle and operation: 1. Thyristor operated dimmer, 2. Triac operated dimmer; Control of Enhance Lighting, Methods used for light control, Control circuits for lamps: ON/OFF control; Control circuits for lamps: single lamp controlled by single switch, two switches.

Unit - IV: Illumination for Interior Applications (2 Periods, 16%)

Topics: Standard for various locations of Interior Illumination; Design considerations for Interior location of residence premises (1/2 BHK); Illumination scheme for different Interior locations of Commercial, industrial unit.

Unit - V: Illumination for Other Applications (3 Periods, 22%)

Topics: Factory Lighting, Street Lighting (Latest Technology), Flood Lighting, Railway Lighting; Brief idea: Lighting for advertisement / Hoardings / sports lighting, Agriculture and Horticulture lighting, Health Care Centers / Hospitals, Decorating Purposes, Stage Lighting, Aquariums and Ship-yards.

Practical Work

- Unit I — Conduct illumination level assessment in workplace using lux meter.
- Unit I — Measure illumination level with and without reflectors used in the various Luminaries.

- Unit II — Fit the given lamp in the selected mounting.
- Unit II — Estimate and compare luminous efficiency of incandescent and compact fluorescent lamp.
- Unit III — Prepare light dimmer arrangement using the relevant dimmer type of transformer.
- Unit III — Build an electronic dimmer – Part I.
- Unit III — Build another type of electronic dimmer – Part II.
- Unit IV — Measure the illumination output of different lamps (Incandescent, Fluorescent, CFL, LED, HPSV, HPMV) and compare it with their wattage.
- Unit V — Build a single lamp control by single switch.
- Unit V — Build a single lamp control by two switches.

Reference Books (as listed in the syllabus)

- Lindsey, Jack L., Applied Illumination Engineering, The Fairmont Press Inc.
- Simons, R. H., Bean, Robert; Lighting Engineering: Applied Calculations, Architectural Press. ISBN: 0750650516
- Casimer M Decusatis, Handbook of Applied Photometry, Springer, ISBN 1563964163
- Butterworths, Lyons Stanley, Handbook of Industrial Lighting, Butterworths
- Simpson Robert S, Lighting Control Technology and Applications, Focal Press
- Kao Chen, Energy Management in Illuminating Systems, CRC Press

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Source: BTEUP 3rd Year curriculum (folder2627), approved in C.D.C. meeting held on 16.07.2026. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text.

Please confirm with your own polytechnic for any local changes.