SARVAJANIK UNIVERSITY
Sarvajanik College of Engineering and Technology
Bachelor of Technology

B. Tech.-III Semester VI	
Subject Name: Illumination	**Subject Code: BTEL15601**

Type of course:	**Open Elective**
Prerequisite:	Fundamentals of Physics and Electrical Engineering
Rationale:	From the workers' perspective, poor lighting at work can lead to eye-strain, fatigue, headaches, stress and accidents. On the other hand, too much light can also cause safety and health problems such as "glare" headaches and stress. Both can lead to mistakes at work, poor quality and low productivity. Various studies suggest that good lighting at the workplace pays dividends in terms of improved productivity, and a reduction in errors. This course covers almost all sensitive aspects of illumination.

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	100
3	0	0	3	60	25	15	0	0	

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. No.	Topics	Teaching Hrs.	Mapped CO
1.	Introduction to Illumination Engineering Radiation and Color, Eye and Vision, different entities of Illumination system, Laws of Illumination, Photometry, Glare, Color,	**10**	**20**
2.	Light Sources and Lamps: Daylight, Mercury Vapor Lamps, Gas Discharge Lamps, Sodium Vapor Lamps, Fluorescent Lamps, Incandescent, Electric Discharge, Fluorescent, Arc Lamps and Lasers.	**13**	**30**
3.	Lighting Calculation, inverse square law, methods for lighting calculations, Design of Lighting System, Types of Lighting: interior, sports, road lighting, etc.	**12**	**30**
4.	Energy efficient Lighting, LED Lighting, Energy Conservation codes for lighting; lighting controls – daylight sensors and occupancy sensors; controller design, specific design problem.	**10**	**20**

Suggested Specification table with Marks (Theory/Practical):

% Distribution of Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
20	**25**	**25**	**15**	**15**	**-**

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels **(Revised Bloom's Taxonomy)**

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Text Books:

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1	Advanced Lighting Controls: Energy Savings, Productivity, Technology and Applications	Craig DiLouie	CRC Press	2005	
2	Energy Management in Illuminating Systems	Kao Chen	Carlsons Consulting Engineers, San Diego, California, USA, CRC Press	1999	
3	IESNA Lighting Handbook	Mark Stanley Rea	Illuminating Engineering Society of North America, 2000	2000	
4	A Course in Electrical Power	Soni, Gupta and Bhatnagar	Dhanpat Rai & Sons	1996	4th

Course Outcome:

Sr. No.	CO Statement After learning this subject, students will be able to	RBT Level*
CO-1	Comprehend various terms of illumination.	UN,RM
CO-2	Comprehend electrical symbols used in block diagrams, schematics, installation drawings, and other construction drawings	UN,RM
CO-3	Summarize lighting principles related to measurement, efficiency, maintenance, and resource conservation	AP
CO-4	Identify various lighting systems and luminaires.	AN,EV
CO-5	Design lighting system for given application.	EL,CR

*RM: Remember, UN: Understand, AP: Apply, AN: Analyze, EL: Evaluate, CR: Create

Mapping with POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO-1	3	3	1	1	1	1	1	1	2	3	1	2	1	1	1
CO-2	3	3	1	1	1	1	1	1	2	3	1	2	1	1	1
CO-3	2	2	1	1	2	2	1	2	2	2	1	2	2	2	3
CO-4	2	2	2	1	1	2	1	2	2	1	1	2	1	2	3
CO-5	1	1	3	2	2	1	1	2	1	1	1	2	3	3	2

List of Open Source/learning website:

https://nptel.ac.in/courses/108105060

https://www.brainkart.com/article/Illumination--Introduction_13662/

Open Elective: Electrical Eng.