Program Engineering

Specialization	**Electrical Wiring**
Course Number	**20301141**
Course Title	**Electrical illumination and installations**
Credit Hours	**3**
Theoretical Hours	**3**
Practical Hours	**0**

Brief Course Description:

- Introduction to electromagnetic radiation and light , Light quantities ,Electrical lamps and their applications ,Interior Exterior Lighting ,streets lighting ,flood lighting. Illumination calculations ,Electrical Installations , cables and wires ,Junction Boxes , Switches and lighting circuits control ,Trunks and conduits outlets ,sockets , Distribution boards ,Voltage drop calculations ,Protection devices ,Fuses ,Circuit Breakers and Relays.

Course Objectives:

Upon the completion of the course, the student will be able to:

1. To know the basic quantities of light, definitions &relationships
2. Kinds of lamps , characteristics and uses .
3. Interior & exterior lighting, calculations.
4. Electrical installations , protection devices.

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	**Introduction to electromagnetic radiation and light**	▪ Electromagnetic radiation , visible light , ultra – violet and infra – red radiation , light quantities ,luminous flux , quantity of light , luminous intensity , illuminance , luminous efficiency of a source , luminance , glare , photometers , integrating sphere photometers, distribution systems of alight	
2.	**Characteristics of light sources**.	▪ Color characteristics, general – color rendering index , color appearance , color temperature . luminaries , luminous intensity distribution curves for ,incandescent and fluorescent lamps	
3.	**Electrical lamps.**.	▪ Visible light sources , construction ,operation principle ,characteristics and use of ,incandescent lamps ,fluorescent lamps , mercury lamps ,sodium lamps ,neon lamps and induction lamps ,saving energy lamps ,low voltage lamps	
4.	**Interior lighting principles**	▪ General considerations of interior lighting design , lighting levels ,houses lighting ,office and schools lighting , computer holes lighting ,shops and stores lighting ,hotels and	

		hospitals lighting ,industrial lighting	
5.	**Exterior lighting.**	▪ Flood lighting ,building flood lighting ,lighting of vehicles, parks ,playgrounds lighting.	
6.	**Streets lighting principles**.	▪ Introduction , luminance level , glare problem, international commission for illumination (CIE) recommendations , streets and highway lighting , crossing and junctions lighting, tunnels lighting , bridges lighting, isolux curves , illumination design , calculation of illuminance at a point by using isolux curves , calculation of average illuminance by using utilization factor . kinds of lamps use in streets lighting	
7.	**Illumination calculations.**	▪ Inverse square low of illuminance ,horizontal and vertical illuminance ,square meter method ,lumen method (zonal- cavity method)	
8.	**Electrical installations.**	▪ Trunks and conduits, junction boxes, electrical conductors and cables , switches , outlets, sockets. Distribution boards codes and standards.	
9.	**Lighting circuits control and protection**.	▪ Kinds of switches ,switches use in installations: symbols and construction, one –way lighting circuits, double- way lighting circuits ,three-way lighting circuits, fuses ,circuit breakers and relays	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	
	Second Exam	20%	
	Final Exam	50%	
Quizzes		10%	

Teaching Methodology:

- Lectures

Text Books & References:

1. إضاءة المصانع والأبنية العامة الاسس العلمية والخبرة العملية في الهندسة الكهربائية د.عبد المنعم موسى 1995 .
2. Lamps and lighting –A manual of lamps and lighting prepared by members of staff of THORN EM Lighting Ltd, General Editor: M A Cayless and A M Marsden , Third Edition.
3. Electrical Installations Handbook , Siemens , Aktiengesellschaft , John Wiley 1987.
4. Power Distribution and Illumination system, electrical 1999.
5. Basic Electrical Installation work 2005 by Trevor Linsley.