

Title:	Lighting Design	APPROVED
Long Title:	Lighting Design	
Module Code:	ELEC7010	
Credits:	5	
NFQ Level:	Intermediate	
Field of Study:	Electrical Engineering	
Valid From:	Semester 2 - 2010/11 ( February 2011 )	
Module Delivered in	<a href="#">2 programme(s)</a>	
Module Coordinator:	JOSEPH CONNELL	
Module Author:	JOSEPH CONNELL	
Module Description:	This module will equip the student with the necessary knowledge to select equipment and undertake the design of a variety of lighting installations.	
Learning Outcomes		
On successful completion of this module the learner will be able to:		
LO1	Explain the fundamental principles underlying lighting design.	
LO2	Demonstrate the ability to undertake the necessary calculations to design lighting installations using commercial design software as appropriate.	
LO3	Select the correct lighting equipment to ensure the lighting design is effective and efficient in operation.	
LO4	Demonstrate that the design conforms to best practice and meets all safety requirements.	
LO5	Show the ability to be innovative and novel in the approach to design of lighting installations.	
Pre-requisite learning		
Module Recommendations		
This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named CIT module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).		
No recommendations listed		
Incompatible Modules		
These are modules which have learning outcomes that are too similar to the learning outcomes of this module. You may not earn additional credit for the same learning and therefore you may not enrol in this module if you have successfully completed any modules in the incompatible list.		
No incompatible modules listed		
Co-requisite Modules		
No Co-requisite modules listed		
Requirements		
This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed. You may not enrol on this module if you have not acquired the learning specified in this section.		
No requirements listed		
Co-requisites		
No Co Requisites listed		

Module Content & Assessment

**Indicative Content**

**Fundamentals**

Electromagnetic radiation, energy flow, light. The human eye mechanism. Visual response, perception of detail, visual performance, adaptation, perception. Units of light, luminous intensity, luminous flux, illuminance, luminance, intensity distribution, polar intensity diagram, isolux diagram, beam diagram.

**Colour**

Additive and subtractive mixing of colour. Specifying the colour appearance of surfaces and of light sources. Colour rendering of light sources. Colour constancy and colour matching.

**Light production sources**

The production of light, atomic structure of matter, gas discharges, incandescence, fluorescence, daylight. Filament lamps. Tungsten halogen lamps. Low voltage lamps. Gas discharge lamps, fluorescent lamps, low pressure sodium lamps, high pressure sodium, mercury vapour lamps, metal halide lamps. Light emitting diode lamp technology. Lamp circuit control equipment. Lamp efficacies. Technical data for lamps. Lamp survival.

**Luminaires**

Construction of luminaire. Materials and finishes. Mechanical details. Safety. Electrical characteristics. Optical control, reflectors, design of louvers, refraction, diffusion.

**Natural light application**

Luminance distribution of the sky. Variability of daylight. Variation in daylight illuminance. Use of daylight in interiors. Components of the daylight factor, average daylight factor, orientation factors, design of the window fenestration, control of direct sunlight.

**Interior lighting design**

Designing lighting systems for interiors. Planning the layout. Design calculations. Relative luminance of room surfaces. Disability and discomfort glare. Calculation of glare. Uplighting systems. Emergency lighting systems. Use of CIBSE design codes and guides. Using application software for lighting design.

**External lighting design**

Floodlighting of vertical and horizontal surfaces, illuminance levels, design calculations, selection and application of equipment. External influences on design, reflective characteristics of materials, addressing stray light problems and minimising its effect. Lighting columns type and erection. Decorative floodlighting design of buildings, use of colour. Security lighting. Roadway lighting design in accordance with BS EN 13201:2003 Code of Practice for Roadway Lighting. Use of commercial lighting design software.

**Assessment Breakdown**

%

Course Work

100.00%

**Course Work**

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Short Answer Questions	n/a		20.0	Week 3
Written Report	n/a		20.0	Week 6
Written Report	n/a		20.0	Week 8
Project	n/a		40.0	Week 12

No End of Module Formal Examination

**Reassessment Requirement**

**Coursework Only**

*This module is reassessed solely on the basis of re-submitted coursework. There is no repeat written examination.*

The institute reserves the right to alter the nature and timings of assessment

**Module Workload**

<b>Workload: Full Time</b>				
<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	No Description	1.0	Every Week	1.00
Independent & Directed Learning (Non-contact)	No Description	4.0	Every Week	4.00
Lab	No Description	2.0	Every Week	2.00
Total Hours				7.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				3.00

**This module has no Part Time workload.**

## Module Resources

### *Recommended Book Resources*

- D. C. Pritchard, *Lighting*, 6th Ed., Longman UK
- CIBSE 2004, *Code for Lighting*, CIBSE UK
- CIBSE 2005, *Office Lighting*, CIBSE
- CIBSE 2002, *Industrial Lighting*, CIBSE UK
- CIBSE 2006, *Sports Lighting*, CIBSE UK
- D. Phillips 2004, *Daylighting:natural light in Architecture*, CIBSE

*This module does not have any article/paper resources*

*This module does not have any other resources*

Module Delivered in			
Programme Code	Programme	Semester	Delivery
CR_EEPSY_8	<a href="#"><u>Bachelor of Engineering (Honours) in Electrical Engineering</u></a>	5	Elective
CR_EELEC_7	<a href="#"><u>Bachelor of Engineering in Electrical Engineering</u></a>	5	Elective