Course Content

Illumination Engineering (Elective I)			
Lecture	Tutorial	Practical	Credit
3	1	3/2	3

	Internal	Final	Total
Theory	20	80	100
Practical	25	-	25

Course Objective:

To understand the behavior of light, perception of visual environment and electric lighting system and to plan and design lighting installation and system

Course Contents:

1. Introduction of Illumination (6 hours)

- 1.1 Light, eyes and vision
- 1.2 Basic quantities and units of illumination
- 1.3 Basic law of illumination
- 1.4 Illumination calculation
- 1.5 Basic colorimetric, photometric and radiometric measurements
- 1.6 Illumination measuring instruments and devices
- 1.7 Lab and onsite measurements
- 1.8 Measurement standards

2 Lighting Technologies (6 hours)

- 2.1 Various light sources their operating principles and performances
- 2.2 Electrical and optical properties of LED, LEDD lamp performance and applications
- 2.3 Luminaires, ballast and drivers
- 2.4 Basic optics and its application in light sources Lighting control circuits
- 2.5 Lighting product and practices in indoor and outdoor applications

3 Energy Efficient Lighting Systems (5 hours)

- 3.1 Energy required for lighting
- 3.2 Energy performance codes and standards
- 3.3 Efficient lighting policies and management
- 3.4 Efficient lighting practices
- 3.5 Smart lighting system

4 Illumination and Lighting and Specific Field (16 hours)

- 4.1 Building interior and exterior lighting
  - 4.1.1 Residential buildings
  - 4.1.2 Commercial buildings
  - 4.1.3 Hospital lighting
- 4.2 Sports lighting
  - 4.2.1 Indoor lighting
  - 4.2.2 Outdoor lighting
- 4.3 Street lighting

4.4 Lighting for agriculture and farming
4.5 Tunnel lighting, landscape lighting
4.6 Aerodrome lighting system
4.6.1 Visual aids and aerodrome lighting, lighting fixtures and structure
4.6.2 Airport lighting control and monitoring system (ALCMS)
4.6.3 ALCMS applications, location and characteristics of aerodrome lighting
4.6.4 Types and characteristics of aerodrome lighting system

5 Lighting Design and Simulation (12 hours)

5.1 Basic of lighting design
5.2 Lighting quality aspects, codes and standards
5.3 Lighting design principles and process
5.4 Lighting calculation for indoor and outdoor application
5.5 Introduction of lighting design software
5.6 Lighting calculations and simulations using lighting design software
5.7 Lighting estimation and cost analysis

Tex Books:

1. Jack L. Lindsey, "Applied Illumination Engineering" The Fairmont Press Inc.
2. Ronald N. Helms, M. Clay Beicher, "Lighting for Energy Efficient Luminous Environments", Prentice Hall.

References:

1. IES Lighting Handbook, 8th Edition
2. Aerodrome Design Manual
3. ACAO Annex-14