
COURSE SYLLABUS

COURSE INFORMATION

Course name	: Lighting Technology
Course code	: ECE 430
Pre- & co-requisites	: Electric circuits 1 (ECE 201)
Program	: Bachelor of Electrical Electronics Engineering
Major	: Electrical Electronics Engineering
Credits	: 4 (3, 1)
Hours	: 60 (30 hours of lecture, 30 hours of laboratory) + 75 hours self - study
Equipments needed (if any)	: Projector, Computer, experimental devices
Department	: School of Engineering/ Department of Electrical and Electronics Engineering

COURSE DESCRIPTION

Lighting Technology is an elective course belonging to the specialized knowledge of Electrical Electronic Engineering program.

This course will provide substantial coverage of lighting parameters and technologies and it will provide insights in how to use this knowledge for designing lighting systems with simulation software. In addition, this course can help students improve their experimental skills through multiple hand - on labs with lighting equipment

COURSE OBJECTIVES

1. Knowledge

CLO 1	List lighting parameters and terminologies	PLO 5.5
CLO 2	Calculate lighting parameters	PLO 5.5
CLO 3	Apply calculation methods of lighting design	PLO 5.5

2. Skills

CLO 4	Use basic lighting equipment (such as: Lux meter, Luminance meter, Reflectometer...) to measure lighting parameters	PLO 7.1
CLO 5	Lighting design through simulation	PLO 7.1
CLO 6	Have good teamwork skill	PLO 7.1

3. Attitudes

CLO 7	Have professional ethics	PLO 10.1
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COURSE MATERIALS

Primary books for the course (available in EIU library)

- [1]. David, L. (2011). *The Lighting Handbook* (10th edition). Illuminating Engineering Society.
[2]. Mark Karlen (2004). *Lighting design basics*, Published by John Wiley
[3]. Dương Lan Hương (2010), *Kỹ thuật chiếu sáng*, NXB ĐH Quốc gia TP. Hồ Chí Minh

COURSE CONTENT

	Hours (Theory/ Practice)
Chapter 1. Lighting basics and Colorimetry	4T/4P
1.1. Theories of light	
1.2. Electromagnetic spectrum	
1.3. Concept of color	
1.4. CIE colorimetry	
1.5. Color Temperature	
1.6. Color Rendering Index	
Chapter 2. Photometry	2T/4P
2.1. Radiometric quantities	
2.2. Photometric quantities	
2.3. Measurement techniques	
Chapter 3. Lighting sources and Luminaire types	4T/4P
3.1. Natural light sources	
3.2. Artificial light sources	
3.3. Luminaire types and specifications	
Chapter 4. Lighting calculation and design	4T/8P
4.1. Introduction to lighting design	
4.2. Light quantities	
4.3. Validation methods of light designs	
4.4. Measurement plan	
Chapter 5. Lighting computer simulation	4T/6P
5.1. Introduction to DIALux software	
5.2. Working with simulation software	
5.3. Identify the simulation steps	
5.4. Set up and run simulations	
Chapter 6. Lighting applications	6T/4P
6.1. Office lighting	
6.2. Workshop lighting	

6.3. School and kindergarten lighting

Chapter 7. Road and street lighting

2T/0P

- 7.1. Quality of road lighting
- 7.2. Luminance and illuminance
- 7.3. Lighting classes (CIE 115)
- 7.4. Uniformity, glare limitation and road surfaces

ASSESSMENT

Type of formative assessment	Content	Method	CLO	Weight
Formative Evaluation	(1) Regularity, Punctuality, Behaviour, and Quizzes	Attendance and Attitude	7	10%
	(2) Use lighting equipment and control system proficiently	Practice	4, 5, 6, 7	20%
Sumative Evaluation	(3) Term project	Rubric	2, 3, 6	20%
	(4) Calculate lighting parameters; Apply calculation methods of lighting design	Final exam	1, 2, 3	50 %
Total:				100%

SCHEDULE OF CLASS LESSONS

WEEK 1

Implement CLO 1

Formative evaluation (1)

Learning activity	CLO
➤ Read	
1. Chapter 1.1 to 1.4 – Learning Material [1]	1
➤ Discuss	
1. The concepts related to light	1

WEEK 2

Implement CLO 1, 2, 4, 6

Formative evaluation (1) (2)

Learning activity	CLO
➤ Read	
1. Chapter 5 and chapter 9 – Learning Materials [1]	1
➤ Discuss	
1. The concept of photometric	
➤ Pratice	
1. Lab 1: Electric Light Sources	2, 4, 6

WEEK 3

Implement CLO 1, 2, 4, 6,
Formative evaluation (1), (2) (3)

Learning activity	CLO
➤ Read	
1. Chapter 16 – Learning Material [1]	2
➤ Discuss	
1. Light sources	1
➤ Practice	
1. Lab 2: Verification of inverse square law	2, 4, 6

WEEK 4

Implement CLO 3, 4, 6
Formative evaluation (1), (4)

Learning activity	CLO
➤ Read	
1. Chapter 16 – Learning Material [1]	3
➤ Discuss	
1. Sensors	
➤ Practice	
1. Lab 3: Measurement of average illuminance on a space	2,4,6

WEEK 5

Implement CLO 2, 4, 5, 6
Formative evaluation (1), (2) (3)

Learning activity	CLO
➤ Read	
1. Chapter 5 – Learning Material [1]	5
➤ Discuss	
1. Methods of lights designs	5
➤ Practice	
1. Lab 4: Validation methods of lights designs	2, 4, 6

WEEK 6

Implement CLO 2, 4, 5, 6
Formative evaluation (1), (2)

Learning activity	CLO
➤ Read	
1. Chapter 3 – Learning Materials [3]	5
➤ Discuss	
1. Simulation software	5
➤ Practice	
1. Lab 5: Computer with lighting simulation software	5, 6, 7

WEEK 7

Implement CLO 1, 2, 3, 6
Formative evaluation (1), (2) (3)

Learning activity	CLO
➤ Read	
1. Chapter 10, 11 – Learning Materials [3]	4

- **Discuss**
 - 1. Topics in Lighting applications 3
- **Pratice**
 - 1. Lab 5: Computer with lighting simulation software (cont.) 5, 6, 7

WEEK 8

Implement CLO 1, 2, 3, 6

Formative evaluation (1), (3)

Learning activity CLO

- **Read**
 - 1. Chapter 10, 11 – Learning Meterials [3] 3
- **Discuss**
 - 1. Topics in Lighting applications 3
- **Pratice**
 - 1. Lab 6: Lighting design through simulations 5, 6, 7

WEEK 9

Implement CLO 3 - 9

Formative evaluation (2), (3)

Learning activity CLO

- **Term Project Report**
 - 1. Project report 3, 5, 6, 7
- **Pratice**
 - 1. Lab 8: Course Review 4, 6, 7

COURSE POLICIES

- Get a minus point of formative evaluation (1) for each absence from class
- The practical exercises/asignments score is the average of all practical exercises/ asignments.
- Get a plus point of formative evaluation (1) for positive contribution three times

INSTRUCTORS' INFORMATION

Instructor 1

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Binh Duong, 14th October 2021

Dean of School Of Engineering
(Sign & full name)



Duong Hoai Nghia

Head of deparment



Duong Hoai Nghia

Instructor 1
(Sign & full name)



Phan Xuan Dung

APPENDIX

APPENDIX I. RUBRIC FOR TERM PROJECT EVALUATION

Use for the formative evaluation (3)

Criteria	CLO	Weak (10% of max score)	Average (50% of max score)	Good (80% of max score)	Excellence (100% of max score)	Max Score	Student Score
1. Problem and objective	4, 5	Cannot define the problem and its objectives	Might partly define the problem and its objectives	Might define almost the problem and its objectives	Well define a problem and its objectives	10	
2. Project content		Unsatisfy the requirements	Partly finish the requirements	Almost finish the requirements	Finish the all requirements	50	
3. Report	8, 9	The report is present in unstructure. Format, color, ...	The report is presented good enough, but still has several errors: format, color	The report is presented and organized well	The report is presented and organized very well in both content and presentation	10	
4. Presentation	5	Do not prepare slides or slides are unstructured	Prepare slides for a presentation, but presentation skills are not good enough. Can not answer the question, correctly.	Slides are well prepared, presentation skills are good, confidence and answers almost questions.	Slides are well prepared, presentation skills are good, confidence and answers all questions. Might provide more challenging question to reviewers	20	
5. Organize and teamwork	7	Failure to organize and divide the task of members in a group	Not organize and divide well the tasks to each member.	Organize and divide the tasks to each member, well.	Organize and divide the tasks to each member, well. All members finish the task.	10	
					Total	100	

APPENDIX II. ATTENDANCE EVALUATION

Use for the formative evaluation (1)

Student Attendance Sheet												
#	Student ID	Full Name	Class ID	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Result
1												
2												
3												
4												
5												
6												
7												
8												
9												

APPENDIX 2. TEST BLUEPRINT AND MARKING SCHEME

1. FINAL EXAM

- Used to conduct evaluation activity (4)

TEST BLUEPRINT

Assessment Content	CLO	Remember	Understand	Apply	Analyze	Evaluate	Create	Total questions	Point
Calculate lighting parameters	1, 2		{1}	1}				1	40
Apply calculation methods of lighting design	3			{1	1}			1	60
Total									100

MARKING SCHEME (For writing exams)

Question 1 (40 points):

- Calculate the values of illuminance on the working plane.

Suggestive answer

- Based on the parameters of the problem, apply the formula to calculate

Question 2 (60 points):

- Determine the lighting parameters to design.

Suggestive answer

- Based on the requirements and design criteria for choosing coefficients
- Apply the formula to calculate the parameters

Point

40

60

Total 100