



DIVISION OF ENGINEERING

Bachelor Program in Electrical Engineering

Thematical Plan

Course	LIGHTING TECHNOLOGY
Code - EE357	Type - Specialization
Symbol	LT
Level – 3	Year – 3 rd
Term – 5 th	Credit – 5 = 150 h (64 h of contact and 86 h self study)

1. Objectives of the course

- Promote energy efficiency in lighting, including the choice of efficient technologies and energy-saving practices;
- Apply simulation software to design interior, exterior and public lighting projects;
- Acquire basic knowledge of intelligent and efficient lighting;
- Perform life cycle analysis on lighting systems.

2. Requirements

Attendance at the course is conditional on passing the Introduction to Luminotechnics course.

3. Contents (Thematic planning)

Them	Contents	Contact Hour		Self Study Hours
		Lesson	Lab.	
1	Energy Efficiency and Sustainability <ul style="list-style-type: none"> • Efficient Technologies: use of high-efficiency light sources and design practices to minimize energy consumption. • Sustainable Lighting: practices and strategies to reduce the environmental impact of lighting, such as the use of natural lighting and automatic control. • Light pollution: how light pollution interferes with ecosystems, negative effects 	04	02	06

	on health, reduced visibility of stars and astronomical observation.			
2	Lighting Design Tools and Software <ul style="list-style-type: none"> • Simulation Software: use of RELUX software to simulate and visualize lighting projects. • 3D Modeling: modeling and visualization techniques to predict how lighting will affect the space. 	04	10	20
3	Standards and regulations <ul style="list-style-type: none"> • Requirements and standards on lighting design and energy used in lighting • National and international standards 	02	02	10
4	Energy and Environment <ul style="list-style-type: none"> • Life cycle analysis (environmental) • Life cycle cost analysis (economic) 	02	04	10
5	Smart lighting <ul style="list-style-type: none"> • Introduction to smart lighting: definition and operation, advantages, costs and installation. 	02	06	05
6	Aplicações Práticas e Projetos (Criação de projetos de iluminação detalhados como parte de avaliações práticas) Practical Applications and Projects (Creation of detailed lighting projects as part of practical assessments) <ul style="list-style-type: none"> • Prevention of project errors: proper planning, management of specific risks, efficient communication, continuous learning. • Residential Projects: lighting planning for homes, including indoor and outdoor areas; • Commercial and Industrial Projects: lighting design for offices, stores, factories and other commercial and industrial environments; 	06	10	25

	<ul style="list-style-type: none"> • Public lighting: planning lighting for public spaces such as streets, parks and squares; • Road lighting: tunnel lighting design; • Lighting for agriculture and poultry farming: lighting design for agriculture and poultry farming; • Lighting for sports campuses: lighting design for open and closed campuses for sports activities. 			
7	Case Studies and Critical Analysis <ul style="list-style-type: none"> • Analysis of Existing Projects: study and critical analysis of existing lighting projects to identify good practices and areas for improvement. 	02	08	10
Sub-totals		22	42	86
TOTAL		150		

4. Basic Bibliography

- [1] KARLEN, M., SPANGLER, C., & BENYA, J. R. (2017). **Lighting design basics** (3rd ed.). Wiley.
- [2] DILAURA, D. L., HOUSER, K. W., MISTRICK, R. G., & STEFFY, G. R. (2011). **The lighting handbook: Reference and application** (10th ed.). Illuminating Engineering Society.
- [3] INNES, M. (2012). **Lighting for interior design**. Laurence King Publishing.

5. Further References

- [4] STEFFY, G. (2008). **Architectural lighting design** (3rd ed.). Wiley.
- [5] BEAN, R. (2004). **Lighting: Interior and exterior**. Elsevier.
- [6] CUTTLE, C. (2015). **Lighting design: A perception-based approach**. Routledge.
- [7] BOYCE, P. R. (2014). **Human factors in lighting** (3rd ed.). CRC Press.
- [8] Tregenza, P., & Wilson, M. (2011). **Daylighting: Architecture and lighting design**. Routledge.
- [9] Cuttle, C. (2008). **Lighting by design**. Routledge.

6. Software

RELUX- Design and planning software for lighting systems

7. Lecturer

Lecturers from ISPS will teach the course.