POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Lighting design and visualization computer process [S2Eltech1E-TŚ>KPPOiW]

Course

Field of study	Year/Semester
Electrical Engineering	2/3
Area of study (specialization)	Profile of study
Lighting Engineering	general academic
Level of study	Course offered in
second-cycle	english
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
0	0	0
Tutorials	Projects/seminars	
0	30	

Number of credit points

2,00

Coordinators	Lecturers
dr inż. Przemysław Skrzypczak przemyslaw.s.skrzypczak@put.poznan.pl	

Prerequisites

The student starting this subject should have basic knowledge of lighting technique, in particular, in the field of lighting design and lighting equipment. He should have basic information on the construction and operation of lighting equipment, taking into account their impact on the environment. He should also have the ability to obtain information from the indicated sources and be ready to cooperate as part of the team.

Course objective

Learn how to create LDT photometric files from real photometric data. Learning how to create complex irregular spatial objects with the use of photogrammetry - based on the photograph of the object. Learning the skills of lighting design in Dialux 4.XX and Dialux Evo software. Detailed knowledge of the principles and methods of designing illumination lighting. Getting to know the environment, basic and advanced tools of the 3ds MAX software. The ability to create computer visualization of illumination of objects, taking into account the actual lighting equipment. The ability to calculate the luminance on the facade of the illuminated object.

Course-related learning outcomes

Knowledge:

Has in-depth knowledge of lighting technology in the field of lighting design, photometric and colorimetric measurements, knows the processes taking place in the life cycle of selected electrical devices.
Has extended knowledge of computer-aided design in electrical engineering.

Skills:
Can formulate and test hypotheses related to engineering and simple research problems, develop detailed documentation of the results of the experiment, design task, interpret the obtained results and draw conclusions.
He can design and manufacture elements and complex electrical devices and systems, taking into account the given non-technical criteria (utility and economic), if necessary, adapting the existing or developing new methods, techniques and computer-aided design tools.

Social competences:
Understands the importance of knowledge in solving cognitive and practical problems and understands that in technology, knowledge and skills quickly become obsolete, and therefore require constant replenishment.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge and skills acquired during design classes are assessed by assessing the activity during classes and individual design tasks.
Individual projects about: creating a photometric file based on real data, creating a spatial object based on photographs with the use of photogrammetry, creating a computer visualization of the illumination of a selected architectural object.
The project takes into account the ability to model the body of the object, assigning specific materials in the scene as well as the selection and appropriate placement of lighting equipment.

Programme content

Getting to know the structure of the LDT file and the use of the program for creating photometric files.
Expanding knowledge in the field of lighting design, design documentation and lighting calculations in Dialux and Dielux Evo.
Getting to know the basic functions of the program for generating a 3D object based on photography.
Expanding knowledge about construction, application and selection of lighting equipment used in the illumination of architectural objects, knowledge of the principles and methods of illumination of objects.
Getting to know the basic and advanced functions of the 3ds MAX software.
Performing the visualization of the illumination of the selected object.

Teaching methods

A multimedia presentation enabling the analysis of the applied methods of illumination and the obtained effects of visualization.
Comparison of the obtained lighting effects, measurable (levels of illuminance, luminance and their uniformity) and non-measurable (aesthetic impressions).

Bibliography

Basic:
1. Żagan W.: Iluminacja obiektów. Ofic. Wyd. Pol. Warszawskiej, Warszawa 2003.
2. Kelly L.Murdock 3ds MAX 2012 Helion 2012

Additional:
1. Lighting Handbook, Reference Application. IES of Nofth America, New York 2010
2. Górczewska M.,Mroczkowska S., Iluminacja kościoła p.w. Św. Józefa w Poznaniu. Poznan University of Technology, Academic Journals, Electrical Engineering, Issue 83, Poznań 2015, s.229-236, ISSN 1897-0737
3. Górczewska M., Mroczkowska S., Skrzypczak P., Oświetlenie rzeźb i pomników, Przegląd Elektrotechniczny, 2/2018 R.94, s.124-127
4. Górczewska M.,Mroczkowska S., Iluminacja rzeźb i pomników. Poznan University of Technology,

Breakdown of average student's workload

	Hours	ECTS
Total workload	55	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00