COURSE DESCRIPTION CARD - SYLLABUS

Course name
Light and Lighting [S1Eltech1>C-SiO]

Course

Field of study
Electrical Engineering

Year/Semester
3/6

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
15

Laboratory classes
30

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

The student starting this course should have a basic knowledge of physics, visible radiation and lighting engineering. Basic skills in measuring electrical and photometric parameters. The ability to effectively self-study in a field related to the chosen field of study.

Course objective

Providing students with in-depth information on visible radiation, photometric and colorimetric parameters, and the construction and operation of lighting equipment. To acquaint students with the practical aspects of photometric and colorimetric measurements and testing of lighting equipment. Developing students" ability to choose the measuring method and appropriate measuring equipment for the problem.

Course-related learning outcomes

Knowledge:
1. Knows the spectrum of solar radiation and the differences in spectral distributions between the sun

and electric lamps.
2. Has knowledge in the field of photometry, colorimetry and lighting equipment, knows and understands the laws associated with optical radiation.

Skills:
1. Is able to use his knowledge in the selection of equipment and measurement methods for photometric and colorimetric parameters in order to perform the measurement and acquisition of basic measurable quantities characteristic of lighting engineering in typical and atypical conditions.
2. Is able to properly use luxmeters, colorimeters, photometers and spectrophotometers in accordance with general requirements and technical documentation.

Social competences:
1. Is aware of the contribution of their own work for the good of the team and the workplace and the need to comply with professional ethics. Is able to cooperate in a team and take over various functions during the implementation of a given task.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Knowledge acquired as part of the lecture will be verified by the colloquium passed on the last lecture. The test consists of 15-25 questions (test and open), variously scored. Pass threshold: 51% points. Final issues, based on which questions sent to students by e-mail are developed using the university e-mail system or placed on the eKursy platform.
Skills acquired as part of the laboratory are verified on the basis of at least one presentation containing the analysis of the results obtained, the conclusions of the measurements and a discussion regarding the results obtained. Assessment threshold: positive evaluation of the presentation.

Programme content

Lecture: Methods and principles for measuring photometric parameters. Construction and principle of the departments of measuring apparatus used for measuring light quantities. Estimation of measurement errors of light quantities. Photometric standards. Geometric systems for presenting photometric properties of lamps and luminous. Basics of colorimetry. Additive and subtractive color mixing. Description of colorimetric systems. Colorimetric measurements. Color management systems. Parameters and characteristics of electric lamps. High pressure lamps, light-emitting diodes - operation, structure, parameters and characteristics. Systematics of lighting luminous. Control in the circuits of lighting luminous.
Laboratory: Practical exercises in the field of: measurement of luminous intensity, testing of photodetectors, testing photometric features of Ulbricht sphere, study of photometric and electrical parameters of lamps for home use, lighting control systems, measuring spectral distributions and colorimetric parameters of lamps, study the photometric and colorimetric properties of monitors, subjective evaluation of color rendering, study of of light-emitting diodes (LEDs).

Teaching methods

Lecture: multimedia presentation (drawings, photos, charts) supplemented with examples given on the board.
Laboratory: Performing practical tasks under the supervision of the lecturer. Discussion related to results obtained during measurements.

Bibliography

Basic
1. Żagan W.: Podstawy technik świetlnej. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2014.
2. Wiśniewski A.: Elektryczne źródła światła. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2010.
3. Żagan W.: Oprawy oświetleniowe : kształtowanie rozsyłu strumienia świetlnego i rozkładu luminancji , Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2012
4. Dybczyński W,: Miernictwo promieniowania optycznego, Wydawnictwa Politechniki Białostockiej,

Białystok 1996.
Additional
1. Lighting Handbook, Reference &Application. IES of North America, New York 2010
2. Bąk J., Pabjańczyk W.: Podstawy techniki świetlnej. Wydawnictwo Politechniki Łódzkiej, Łódź 1994.
3. Materiały dydaktyczne dostępne na stronie: http://lumen.iee.put.poznan.pl

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	33	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	42	2,00