COURSE DESCRIPTION CARD - SYLLABUS

Course name
Photometry [N1Eltech2>PO3-Fot]

Course

Field of study
Electrical Engineering

Year/Semester
4/7

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
part-time

Requirements
elective

Number of hours

Lecture
10

Laboratory classes
10

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

Students starting this course should have basic knowledge of physics, visible radiation and lighting engineering. Basic skills in measuring electrical and photometric quantities. Ability to effectively engage in self-study in a field related to their chosen field of study.

Course objective

Providing students with in-depth information on visible radiation, photometric and colorimetric quantities, and the design and operation of measuring equipment. Familiarising students with the practical aspects of photometric and colorimetric measurements. Developing students' skills in selecting measurement methods.

Course-related learning outcomes

Knowledge:
1. Has knowledge of photometry, colorimetry and lighting equipment, knows and understands the laws related to optical radiation.
2. Has knowledge of measuring basic photometric and spectrophotometric quantities.

Skills:
1. Able to use their knowledge in selecting equipment and methods for measuring photometric and colorimetric quantities in order to measure and acquire basic measurable quantities characteristic of lighting engineering in typical and atypical conditions.
2. Is able to correctly operate lux meters, colorimeters, photometers and spectrophotometers in accordance with general requirements and technical documentation.

Social competences:
1. Understands the importance of knowledge in solving technical problems. Is aware of the rapid technological progress in lighting engineering and the associated need to systematically expand their knowledge and apply modern lighting solutions in design.
2. Is aware of the contribution of their own work to the good of the team and the workplace, and the need to adhere to professional ethics. Is able to work in a team and take on various roles during the implementation of a given task.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during the lecture will be verified by a final test administered during the last lecture. The test consists of 15-25 questions (multiple choice and open-ended), with varying point values. Pass mark: 50% of points. The exam topics, on the basis of which the questions are prepared, are sent to students by email using the university's email system or posted on the eKursy platform.
The skills acquired during the laboratory classes are verified on the basis of at least two presentations or reports containing an analysis of the results obtained, conclusions from the measurements and a discussion of the results obtained. Pass mark: a positive grade for the presentation.

Programme content

Lecture: Methods and principles of measuring photometric quantities. Construction and principle of operation of measuring equipment used for photometric and spectrophotometric measurements.
Laboratory: Practical application of knowledge acquired during lectures in the field of photometric, electrical and colorimetric measurements.

Course topics

Lecture: Guidelines and principles for performing photometric measurements. Photoconductors - construction, operating principle, basic parameters and characteristics. Methods and principles for measuring luminous flux, luminous intensity, illuminance and luminance. Photometric standards, estimation of measurement uncertainty budget. Construction and operating principles of luxmeters and luminance meters. Classification of meters, meter errors. Spectrophotometric measurements. Photometric properties of materials. Measurement of luminous flux. Geometric systems for presenting the photometric properties of lamps and luminaires. Measurement of luminous intensity. Measurement of the photometric solid of luminous intensity. Photometric properties of materials.
Laboratory: Practical exercises on testing the photometric characteristics of a photometric sphere, measuring luminous flux, measuring luminous intensity, measuring luminance, measuring the spectral sensitivity of fotocells.

Teaching methods

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

Bibliography

Basic:
1. Żagan W.: Podstawy technik świetlnej. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa2014.
2. Wiśniewski A.: Elektryczne źródła światła. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa2010.

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 Standards
2. Publications of the International Commission on Illumination
3. Teaching materials on eCourses
4. Lighting Handbook, Reference &Application. IES of North America, New York 2010
5. Bąk J., Pabjańczyk W.: Podstawy techniki świetlnej. Wydawnictwo Politechniki Łódzkiej, Łódź 1994.

Breakdown of average student's workload

	Hours	ECTS
Total workload	55	2,00
Classes requiring direct contact with the teacher	20	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	35	1,50