



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Lighting equipment

### Course

Field of study

Electrical Engineering

Area of study (specialization)

Lighting engineering

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

Projects/seminars

15

### Number of credit points

5

### Lecturers

Responsible for the course/lecturer:

Krzysztof Wanadchowicz, Ph.D, D. Sc., Eng.

Responsible for the course/lecturer:

email: Krzysztof.Wanadchowicz@put.poznan.pl

tel. 616652397

Faculty of Control, Robotics and Electrical

Engineering

Piotrowo 3A Street, 60-965 Poznań

### Prerequisites

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

### Course objective

The student should obtain advanced knowledge of light generation at lamps, structures, operates and design of discharge lamps, LED's, structure, characteristics, theoretical fundamentals of luminaires.

### Course-related learning outcomes

Knowledge



1. Has in-depth and expanded knowledge of physics, necessary to understand the physical phenomena affecting the properties of electric lamps and the operation of control systems.
2. Has extended knowledge of electrical and photometric measurements; has in-depth knowledge of developing the results of the experiment.
3. Has in-depth knowledge of lighting engineering in the field of the properties of lamps and luminaires, electrical and photometric measurements; knows the processes taking place in the life cycle of electric lamps.

#### Skills

1. Can obtain information from literature, databases and other sources, make their interpretation, evaluation, critical analysis and synthesis, as well as draw conclusions and formulate and exhaustively justify opinions on lighting equipment.
2. Can plan and carry out measurements of basic electrical and photometric quantities.

#### Social competences

1. Understands the importance of knowledge in solving technical problems. Is aware of the intense technological progress in lighting engineering and the related need to systematically expand knowledge.

#### 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 through a written exam. The exam consists of at least twenty test questions. Passing threshold: 51% of points. Assessment issues on the basis of which the questions are developed are available on the Department's website and on the eLearning Moodle platform.

The skills acquired during the laboratory and design classes are verified on the basis of the test report containing the analysis of the obtained results, conclusions from the measurements and a discussion of the obtained results. Passing threshold: positive assessment of the report.

#### Programme content

Lecture: Methods of producing light: incandescence, luminescence. Detailed parameters and characteristics of electric lamps. Fluorescent lamps - construction, characteristics, work systems. High-pressure lamps (mercury lamps, sodium lamps, metal halide lamps) - construction, characteristics, work systems. Light emitting diodes - structure, characteristics, work systems. Systematics of luminaires. Control in the circuits of luminaires. Technical characteristics of LEDs currently available on the lighting market.

Laboratory and project: Practical exercises in the field of testing lamps and luminaires. Discussion, analysis of the obtained results.

#### Teaching methods



Lecture: multimedia presentation (drawings, photos, charts) supplemented with examples given on the board.

Laboratory and project: Performing practical tasks under the supervision of the lecturer.

### Bibliography

#### Basic

1. Żagan W.: Podstawy technik świetlnej. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2005.
2. Wiśniewki A.: Elektryczne źródła światła, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2010.
3. Bąk J., Pabiańczyk W.: Podstawy techniki świetlnej. Wyd. Pol. Łódzkiej, Łódź 1994
4. Catalog cards and subject standards.

#### Additional

1. Literature available on the website: [www.licht.de](http://www.licht.de)
2. Teaching materials available on the website: <http://lumen.iee.put.poznan.pl>.
3. Lighting Handbook, Reference & Application. IES of North America, New York 2010
4. Wandachowicz K.: Charakterystyki techniczne diod świecących. VII Konferencja Naukowo-Techniczna z cyklu Energooszczędność w oświetleniu n.t. Technika Świetlna 2016, Poznań 10.05.2016, s. 27?32.
5. Wandachowicz K., Michałowska N., Taisner M.: Zalety stosowania diod świecących w lampach do użytku domowego oraz w oprawach oświetleniowych, Poznan University of Technology, Academic Journals, Electrical Engineering, 2015, Iss. 83, s. 203-211.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	140	5,0
Classes requiring direct contact with the teacher	70	3,0
Student's own work (literature studies, preparation for laboratory and design classes, preparation of measurement results, preparation for exam, preparation of the project) <sup>1</sup>	70	3,0

<sup>1</sup> delete or add other activities as appropriate