

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Lighting equipment</b>		Code <b>1010321371010321040</b>
Field of study <b>Electrical Engineering</b>	Profile of study (general academic, practical) <b>general academic</b>	Year /Semester <b>4 / 7</b>
Elective path/specialty <b>Lighting Engineering</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: - Classes: - Laboratory: <b>30</b> Project/seminars: <b>15</b>		No. of credits <b>5</b>
Status of the course in the study program (Basic, major, other) <b>other</b>		(university-wide, from another field) <b>university-wide</b>
Education areas and fields of science and art <b>technical sciences</b> <b>Technical sciences</b>		ECTS distribution (number and %) <b>5 100%</b> <b>5 100%</b>
<b>Responsible for subject / lecturer:</b>  dr hab. inż. Krzysztof Wandachowicz email: Krzysztof.Wandachowicz@put.poznan.pl tel. 61 6652397 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Knowledge of the basics of lighting engineering: the calculation and measurement of lighting quantities, lighting equipment and general requirements for lighting design. Basic knowledge of computer science, physics, electrical engineering and thermokinetics.
2	<b>Skills</b>	The ability to use knowledge in lighting engineering to carry out computations, measurement and evaluation of lighting parameters. Ability to effectively self-education in a field related to the chosen field of study.
3	<b>Social competencies</b>	Is aware of the need to broaden their competence, willingness to work together as a team.
<b>Assumptions and objectives of the course:</b> The student should obtain basic knowledge of light generation at lamps, structures, operates and design of incandescent filament lamps and discharge lamps, structure, characteristics, theoretical fundamentals of luminaires.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b> 1. Can describe and explain the operation of the lamps and luminaires. Can describe the conditions, methods and ways of measuring photometric and electric quantities in lighting equipment. - [K_W03 ++, K_W05 ++, K_W15 +++]		
<b>Skills:</b> 1. Can use the appropriate method of measurements and perform measurements of photometric and electric quantities in lighting equipment. Able to analyse the results. - [K_U05 ++, K_U14 ++]		
<b>Social competencies:</b> 1. Is aware of and understands the importance and impact of non-technical aspects of electrical engineering activities, including the impact of light and lighting on the environment and the consequent responsibility for decisions. Can work in a group. Can coordinate the work between team members. - [K_K01 ++]		
<b>Assessment methods of study outcomes</b>		
Laboratory reports.		
<b>Course description</b>		

Terms, conditions and ways of measuring photometric and electric quantities in lighting equipment. Standard requirements for lamps and luminaires. Construction and operation of electric lamps and equipment for electric lamps. Photometrical and electrical characteristics of electric lamps and equipment for electric lamps. Update 2017: Technical characteristics of LEDs currently available on the lighting market. Applied methods of education: laboratory - detailed review of the reports by the laboratory leader and commentary discussions; project - team work, detailed review and discussion on the results obtained.

**Basic bibliography:**

1. Technika Świetlna. Poradnik. PWT, Warszawa 1960.
2. Bąk J., Pabiańczyk W.: Podstawy techniki świetlnej. Wyd. Pol. Łódzkiej, Łódź 1994
3. Żagan W.: Podstawy techniki świetlnej. Ofic. Wyd. Pol. Warszawskiej, Warszawa 2005
4. Wiśniewski A.: Elektryczne źródła światła. Oficyna Wydawnicza Politechniki Warszawskiej. Wydanie I (2010)
5. Philips, Lighting Manual. Wyd.V 1993 r.

**Additional bibliography:**

1. Technika Świetlna 2009. Poradnik 2 Informator. Wyd. PKOś, Warszawa 2009
2. Lighting Handbook, Reference & Application. IES of North America, New York 2010
3. 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.
4. 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.

**Result of average student's workload**

Activity	Time (working hours)	
1. Participation in laboratories	30	
2. Participation in consultation	15	
3. Participation in project activities	25	
4. Preparation for laboratory and project exercises and develop reports	55	
<b>Student's workload</b>		
Source of workload	hours	ECTS
Total workload	125	5
Contact hours	70	3
Practical activities	110	4