

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Lighting equipment		Code 1010325341010321040
Field of study Electrical Engineering	Profile of study (general academic, practical) general academic	Year /Semester 2 / 4
Elective path/specialty Lighting Engineering	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time,part-time) part-time	
No. of hours Lecture: 9 Classes: - Laboratory: 9 Project/seminars: 9		No. of credits 3
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) university-wide
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 3 100% 3 100%
Responsible for subject / lecturer: dr hab. inż. Krzysztof Wandachowicz email: Krzysztof.Wandachowicz@put.poznan.pl tel. 61 6652397 Faculty of Electrical Engineering ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	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	Skills	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	Social competencies	Is aware of the need to broaden their competence, willingness to work together as a team.
Assumptions and objectives of the course: The student should obtain advanced knowledge of light generation at lamps, structures, operates and design of incandescent filament lamps and discharge lamps, structure, characteristics, theoretical fundamentals of luminaires.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Can describe and explain the operation of the lamps and luminaires. Capable of detecting lamps from the electrical and photometric characteristics. - [K_W03 ++,K_W11 ++, K_W13 +++]		
Skills: 1. Can assess the usefulness of lamps and luminaires. - [K_U01 ++, K_U09 ++]		
Social competencies: 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 ++]		
Assessment methods of study outcomes		
Oral and written examination, laboratory reports.		
Course description		

Parameters and characteristics of lamps. Incandescent filament lamps (vacuum, gas-filled, tungsten halogen) ? structures, parameters and characteristics. Fluorescent lamps ? basic principles, structures, characteristics, feed systems. High intensity discharge lamps (high pressure mercury, sodium, metal halide lamps) ? basic principles, structures, characteristics, feed systems. LED - basic principles, structures, characteristics. Systematic of luminaires. Light management systems. Update 2017: Technical characteristics of LEDs currently available on the lighting market. Applied methods of education: lectures - lecture with multimedia presentation (including drawings, photographs, animations, sound, video) supplemented administered examples on the board; lecture conducted in an interactive way of formulating questions to a group of students or indicated specific students; 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 ?09. Poradnik ? Informator. Wyd. PKOś, Warszawa 2009
2. Lighting Handbook, Reference &#38;#38;#38; Application. IES of Nofth 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 lectures	9
2. Participation in laboratories	9
3. Participation in project activities	9
4. Participation in consultations	18
5. Preparation for laboratory and project exercises and develop reports	18
6. Exam preparation	9

Student's workload

Source of workload	hours	ECTS
Total workload	72	3
Contact hours	45	2
Practical activities	63	2