

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Diploma seminar		Code 1010325341010320081
Field of study Electrical Engineering	Profile of study (general academic, practical) (brak)	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: - Classes: - Laboratory: - Project/seminars: 18		No. of credits 13
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 13 100% 13 100%
Responsible for subject / lecturer: Krzysztof Wandachowicz DSc email: Krzysztof.Wandachowicz@put.poznan.pl tel. 61 6652397 Faculty of Electrical Engineering ul. Piotrowo 3A 60-965 Poznań		Responsible for subject / lecturer: Małgorzata Zalesińska Ph.D. email: Malgorzata.Zalesinska@put.poznan.pl tel. 61 6652398 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 technology: the calculation and measurement of basic lighting, lighting equipment, general requirements for lighting design. Basic knowledge of computer science. Basic knowledge of physics, electrical engineering, thermometry and termocinetics
2	Skills	The ability to use knowledge in lighting technology 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: Preparing for a future independent thesis		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Use knowledge of lighting techniques mainly in the selection of lighting systems, evaluating technical feasibility and operational - [K_W15 +++]		
Skills: 1. Analyze the psychophysiological and technical requirements for the selection and design of interior lighting and outdoor lighting - [K_U23 ++] 2. Develop documentation on lighting design and prepare presentation with a discussion of the results of this task - [K_U23 ++]		
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 - [K_K01 ++] 2. Able to work in a group. Able to share and coordinate the work between team members - [K_K03 ++]		
Assessment methods of study outcomes		

<p>Verification of progress in the development of the thesis topic on the basis of the presentation. Assessment of the knowledge and skills related to the execution of the assignment.</p> <p>Get extra points for the activity in the classroom, the organizational skills, ability to work within a team developed aesthetic care tasks.</p> <p>Papers and presentations related to the subject matter of currently conducted research.</p>	
<p>Course description</p>	
<p>Content related directly to the topic of work. Review and analysis of scientific literature. Formal and substantive aspects of preparation of thesis.</p> <p>Student presentations and presentations related to current research topics.</p> <p>Students carry out research projects related to scientific research.</p> <p>Applied methods of education:</p> <p>Project - presentations of progress in research, analysis and discussion of various aspects of solving problems, including: economic, environmental, energy efficiency, analysis and discussion of various problem solving methods.</p>	
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. Żagan W.: Podstawy techniki świetlnej. Ofic. Wyd. Pol. Warszawskiej, Warszawa 2005 2. Żagan W.: Iluminacja Obiektów, Oficyna Wydawnicza PW, Warszawa 2003 3. Hauser J.: Elektrotechnika . Podstawy elektrotermii i techniki świetlnej, Wyd. PP, Poznań, 2006 4. Dybczyński Wł.: Miernictwo promieniowania optycznego. Wyd. Pol. Białostockiej, Białystok 1996 5. Wiśniewski A.: Elektryczne źródła światła. Oficyna Wydawnicza Politechniki Warszawskiej. Wydanie I , 2010 6. Bąk J. Technika oświetlania. Wybrane zagadnienia oświetlenia wnętrz, COSiW, Warszawa 2014 7. Wandachowicz K. Synteza odbłyśników oświetleniowych metodą promieni odwrotnych, Monografia habilitacyjna, Wydawnictwo Politechniki Poznańskiej, Poznań 2015 8. Pawlak A., Zalesińska M., Comparative study of light sources for household, Management Systems in Production Engineering, 2017, No1 (25), pp 35-41, DOI 10.1515/mspe-2017-0005 9. Zalesińska M, Górczewska M.: Comparative study of lighting quality and energy efficiency for various road lighting situations, VI. IEEE Lighting Conference of the Visegrad Countries LUMEN V4, Karpacz, Poland, September 13 - 16, 2016, LumenV4 pp. 205-209. 10. Krzysztof Wandachowicz, Małgorzata Górczewska, Reflector shape design optimization merit function, VI IEEE Lighting Conference of the Visegrad Countries LUMEN V4, 13-16.09.2016, Karpacz, Poland, pp. 191 ? 194, DOI: 10.1109/LUMENV.2016.7745543 11. Zalesińska M.: Atrakcyjność reklam LED, a ich zagrożenie dla bezpieczeństwa ruchu drogowego i uciążliwość dla mieszkańców. Miesięcznik INPE SEP. Informacje o normach i przepisach elektrycznych. Nr 191-192, sierpień ? wrzesień 2015 r. s. 17-25, ISSN 1234-0081. 12. Górczewska M.: Oświetlenie przejść dla pieszych, VII Konferencja Naukowo-Techniczna z cyklu ?Energoszczędność w oświetleniu? n.t. Technika Świetlna 2016, Poznań 10 maja 2016r. str. 69-74 13. 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 , Poznan 2015, Issue 83, pp. 203-2011. 14. Zalesińska M., Wandachowicz K. Working conditions for the low location lighting system on passenger ships. (Zeszyty Naukowe Akademii Morskiej w Szczecinie) Scientific Journals of the Maritime University of Szczecin, no. 43 (115), 2015, pp 125-130, ISSN 1733-8670 (Printed), ISSN 2392-0378 (online) (http://repository.am.szczecin.pl/handle/123456789/769) 15. Zalesińska M.: Laboratory test of the impact of the area of an LED billboard on drivers's visual performance. Przegląd Elektrotechniczny, R. 91 NR 4/2015, s. 197 ? 200, ISSN 0033-2097 16. Zalesińska M., Wandachowicz K.: Badanie systemu oświetlenia ewakuacyjnego na statkach i promach pasażerskich, IAPGOS 2015; 5(1): 14-19, p-ISSN 2083-0157, e-ISSN 2391-6761 (dostępne: http://e-iapgoss.pl/abstracted.php?level=4&id_issue=877971&dz=s6), DOI.6504/20830157.1148041 17. Górczewska M, Mroczkowska S.: Illumination of the contemporary architectural facilities and buildings, Computer Applications in Electrical Engineering Poznan 2014, vol. 12, pp. 531-540 	
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. Technika Świetlna &#39;09. Tom 2 i 3 Poradnik - Informator. Wyd. PKOś, Warszawa 2013 2. Lighting Handbook, Reference ;Application. I ES of Nofth America, New York 2010 3. Normy przedmiotowe 4. Publikacje dostępne na stronie www.licht.de 	
<p>Result of average student's workload</p>	
<p>Activity</p>	<p>Time (working hours)</p>
1. participation in seminar classes	18
2. participate in the consultations on the seminar	30
3. preparing material for the thesis	60

Student's workload		
Source of workload	hours	ECTS
Total workload	108	13
Contact hours	40	4
Practical activities	68	6