`
=
Ф
α
\Box
N
0
Q
÷
⊐
۵
₹
₹
ζ.
۶
\geq
::
0
Ť.
÷
_

Elective path/specialty Lighting Engineering Cycle of study: First-cycle studies First-cycle studies First-cycle studies Form of study (ful-time, part-time) No. of hours Lecture: - Classes: - Laboratory: - Project/seminars: 18 2 Status of the course in the study program (Basic, major, other) (brak) Education areas and fields of science and art technical sciences Technica	•	STUDY MODULE D	ESCRIPTION FORM		
Electrical Engineering (general academic, practical) (brak) 4 / 8 Elective path/specialty Lighting Engineering Subject offered in: Occurse (compulsory, electh obligatory) Elective path/specialty First-cycle studies Polish Polish No. of hours Lecture: - Classes: - Laboratory: - Project/seminars: 18 Ecture: - Classes: - Laboratory: - Project/seminars: 18 Education areas and fields of science and art (university-wide, from another field) Education areas and fields of science and art and %; Education areas and fields of science and art and %; Education areas and fields of science and art and %; Education areas and fields of science and art and %; Education areas and fields of science and art and %; Ectrs distribution (number and %; Education areas and fields of science and art and %; Ectrs distribution (number and %; Education areas and fields of science and art and %; Ectrs distribution (number and %; Education areas and fields of science and art and %; Ectrs distribution (number and %; Education areas and fields of science and art and %; Ectrs distribution (number and %; Ectrs distribution (number and %; Education areas and fields of science and art and %; Ectrs distribution (number and %; Ectrs distribution of lighting quantities (number and %; Ectrs distribution (nu	Lighting acaign				
Cycle of study:	•	ng	(general academic, practic	al)	Year /Semester 4 / 8
Form of study (full-time.part-time) Form of study (full-time.part-time)		htina Enaineerina	•		Course (compulsory, elective) obligatory
No. of hours Lecture: - Classes: - Laboratory: - Project/seminars: 18 Zestatus of the course in the study program (Basic, major, other) (brak) Education areas and fields of science and art technical sciences Technical sci	<u>~</u>	<u> </u>	Form of study (full-time,part-tim	e)	J J
Lecture: - Classes: - Laboratory: - Project/seminars: 18 Status of the course in the study program (Basic, major, other) (brak) Education areas and fields of science and art technical sciences Technic	First-cy	cle studies	pai	rt-tim	e
Status of the course in the study program (Basic, major, other) (brak) Education areas and fields of science and art technical sciences Technica	No. of hours				No. of credits
Status of the course in the study program (Basic, major, other) (brak) Education areas and fields of science and art technical sciences Thought science science, physics, electrical engineering: the calculation and measurement of lighting engineering the calculation, design. Basic knowledge in lighting engineering to carry out computations, measurement of science, physics, electrical engineering, thermokinetics and illuminating engineering The ability to use knowledge in lighting engineering to carry out computations, measurement of study. The ability to use knowledge in lighting engineering to carry out computations, measurement of study. The ability to use knowledge in lighting engineering to carry out computation, measurement of study. The ability to use knowledge in lighting engineering to carry out computation, measurement of study. The ability to use knowledge in lighting engineering to carry out computation, measurement of technical and illuminating engineering to lighting engineering to engineeri		es: - Laboratory: -	Project/seminars	18	
Education areas and fields of science and art ECTS distribution (number and %)	0.000	•	•	er field)	
ECTS distribution (number and %) Technical sciences Technical sciences Technical sciences Technical sciences Responsible for subject / lecturer: dr in². Krzysztof Wandachowicz email: Krzysztof Wandachowicz @put.poznan.pl tel. 61 6652585 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań Prerequisites in terms of knowledge, skills and social competencies: Knowledge			(1.1.)	- '	ak)
Technical sciences Responsible for subject / lecturer: dr in2. Krzysztof Wandachowicz @put.poznan.pl tel. 61 6652585 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań Prerequisites in terms of knowledge, skills and social competencies: 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 computer science, physics, electrical engineering, thermokinetics and illuminating engineering 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. Social competencies Assumptions and objectives of the course: Understanding the basics of lighting requirements and lighting design methods. Understanding the basics of practical methor designing lighting systems. Ability to perform the calculation of basics lighting quantities. Study outcomes and reference to the educational results for a field of study Knowledge: 1. Able to characterize and describe the basic computer method of calculating the lighting quantities [K_W11 ++, K_W15 +++] Skills: 1. Can perform the calculation of lighting quantities using available software. Is able to do lighting project with regard to the requirements of standards [K_U13 ++, K_U17 ++] 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	Education areas and fields of se	· /			ECTS distribution (number
Technical sciences Responsible for subject / lecturer: dr in2. Krzysztof Wandachowicz @put.poznan.pl tel. 61 6652585 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań Prerequisites in terms of knowledge, skills and social competencies: 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 computer science, physics, electrical engineering, thermokinetics and illuminating engineering 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. Social competencies Assumptions and objectives of the course: Understanding the basics of lighting requirements and lighting design methods. Understanding the basics of practical methor designing lighting systems. Ability to perform the calculation of basics lighting quantities. Study outcomes and reference to the educational results for a field of study Knowledge: 1. Able to characterize and describe the basic computer method of calculating the lighting quantities [K_W11 ++, K_W15 +++] Skills: 1. Can perform the calculation of lighting quantities using available software. Is able to do lighting project with regard to the requirements of standards [K_U13 ++, K_U17 ++] 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	tachnical sciences				2 100%
Responsible for subject / lecturer: dr in². Krzysztof Wandachowicz email: Krzysztof Wandachowicz @put.poznan.pl tel. 61 6652585 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań Prerequisites in terms of knowledge, skills and social competencies: 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 computer science, physics, electrical engineering, thermokinetics and illuminating engineering Skills		ionoos			
dr inż. Krzysztof Wandachowicz email: Krzysztof.Wandachowicz@put.poznan.pl tel. 61 6652585 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań Prerequisites in terms of knowledge, skills and social competencies: Knowledge 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 computer science, physics, electrical engineering, thermokinetics and illuminating engineering 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. Social competencies Assumptions and objectives of the course: Understanding the basics of lighting requirements and lighting design methods. Understanding the basics of practical methor designing lighting systems. Ability to perform the calculation of basics lighting quantities. Study outcomes and reference to the educational results for a field of study Knowledge: 1. Able to characterize and describe the basic computer method of calculating the lighting quantities. [K_W11 ++, K_W15 +++] Skills: 1. Can perform the calculation of lighting quantities using available software. Is able to do lighting project with regard to the requirements of standards [K_U13 ++, K_U17 ++] 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	recimical Sci	lences			2 100%
Skills Skills Skills Skills Social competencies Assumptions and objectives of the course: Understanding the basics of lighting requirements and lighting design methods. Understanding the basics of practical methof designing lighting systems. Ability to perform the calculation of basic lighting quantities. Study outcomes and reference to the educational results for a field of study Knowledge: 1. Able to characterize and describe the basic computer method of calculating the lighting quantities. Skills: 1. Can perform the calculation of lighting quantities using available software. Is able to do lighting project with regard to the requirements of standards [K_U13 ++, K_U17 ++] 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		Knowledge of the basics of light	ting engineering: the calculati	on and	
and evaluation of lighting parameters. Ability to effectively self-education in a field related to the chosen field of study. Social competencies Is aware of the need to broaden their competence, willingness to work together as a team. Assumptions and objectives of the course: Understanding the basics of lighting requirements and lighting design methods. Understanding the basics of practical methof designing lighting systems. Ability to perform the calculation of basics lighting quantities. Study outcomes and reference to the educational results for a field of study Knowledge: 1. Able to characterize and describe the basic computer method of calculating the lighting quantities [K_W11 ++, K_W15 +++] Skills: 1. Can perform the calculation of lighting quantities using available software. Is able to do lighting project with regard to the requirements of standards [K_U13 ++, K_U17 ++] 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					
Assumptions and objectives of the course: Understanding the basics of lighting requirements and lighting design methods. Understanding the basics of practical methof designing lighting systems. Ability to perform the calculation of basics lighting quantities. Study outcomes and reference to the educational results for a field of study Knowledge: 1. Able to characterize and describe the basic computer method of calculating the lighting quantities [K_W11 ++, K_W15 +++] Skills: 1. Can perform the calculation of lighting quantities using available software. Is able to do lighting project with regard to the requirements of standards [K_U13 ++, K_U17 ++] 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	2 Skills	and evaluation of lighting param			
Understanding the basics of lighting requirements and lighting design methods. Understanding the basics of practical methof designing lighting systems. Ability to perform the calculation of basics lighting quantities. Study outcomes and reference to the educational results for a field of study Knowledge: 1. Able to characterize and describe the basic computer method of calculating the lighting quantities [K_W11 ++, K_W15 +++] Skills: 1. Can perform the calculation of lighting quantities using available software. Is able to do lighting project with regard to the requirements of standards [K_U13 ++, K_U17 ++] 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	3		their competence, willingnes	s to w	ork together as a team.
of designing lighting systems. Ability to perform the calculation of basics lighting quantities. Study outcomes and reference to the educational results for a field of study Knowledge: 1. Able to characterize and describe the basic computer method of calculating the lighting quantities [K_W11 ++, K_W15 +++] Skills: 1. Can perform the calculation of lighting quantities using available software. Is able to do lighting project with regard to the requirements of standards [K_U13 ++, K_U17 ++] 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	Assumptions and ob	jectives of the course:			
Knowledge: 1. Able to characterize and describe the basic computer method of calculating the lighting quantities [K_W11 ++, K_W15 +++] Skills: 1. Can perform the calculation of lighting quantities using available software. Is able to do lighting project with regard to the requirements of standards [K_U13 ++, K_U17 ++] 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				ding the	e basics of practical method
1. Able to characterize and describe the basic computer method of calculating the lighting quantities [K_W11 ++, K_W15 +++] Skills: 1. Can perform the calculation of lighting quantities using available software. Is able to do lighting project with regard to the requirements of standards [K_U13 ++, K_U17 ++] 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	or designing lighting system		aducational results for	or a f	ield of study
1. Able to characterize and describe the basic computer method of calculating the lighting quantities [K_W11 ++, K_W15 +++] Skills: 1. Can perform the calculation of lighting quantities using available software. Is able to do lighting project with regard to the requirements of standards [K_U13 ++, K_U17 ++] 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	0 0 0 0 7	omes and reference to the	e Cuucationai results it		
Can perform the calculation of lighting quantities using available software. Is able to do lighting project with regard to the requirements of standards [K_U13 ++, K_U17 ++] Social competencies: 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	Study outco	omes and reference to the	e educational results in		•
requirements of standards [K_U13 ++, K_U17 ++] 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	Study outco Knowledge: 1. Able to characterize and			γuantiti	
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	Study outco Knowledge: 1. Able to characterize and [K_W11 ++, K_W15 +++]			quantiti	
including the impact of light and lighting on the environment and the consequent responsibility for decisions. Can work in a	Study outco Knowledge: 1. Able to characterize and [K_W11 ++, K_W15 +++] Skills: 1. Can perform the calculation	describe the basic computer meth	od of calculating the lighting c		es
group. Can coordinate the work between team members [K_U13 ++, K_U17 ++]	Study outco Knowledge: 1. Able to characterize and [K_W11 ++, K_W15 +++] Skills: 1. Can perform the calculatirequirements of standards.	describe the basic computer meth ion of lighting quantities using avai - [K_U13 ++, K_U17 ++]	od of calculating the lighting c		es

Assessment methods of study outcomes				
Oral and written examination, laboratory reports.				
Course description				

Faculty of Electrical Engineering

Calculation of luminance and illuminance distribution in interiors and open grounds. Practical study of using computer software for lighting design. Making some example calculation for the following application fields: offices, educational buildings, industrial buildings, shops and stores, roads, parking, sports facilities.

Basic bibliography:

- 1. Bąk J., Pabiańczyk W.: Podstawy techniki świetlnej. Wyd. Pol. Łódzkiej, Łódź 1994.
- 2. Żagan W.: Podstawy techniki świetlnej. Ofic. Wyd. Pol. Warszawskiej, Warszawa 2005.
- 3. Normy przedmiotowe.
- 4. Pracki P.: Projektowanie oświetlenia wnętrz. Oficyna Wyd.Politechniki Warszawskiej 2011, ISBN: 9788372079282.

Additional bibliography:

1. Lighting Handbook, Reference &Application. IES of Nofth America, New York 2010

Result of average student's workload

Activity	Time (working hours)
Participation in project activities.	18
2. Participation in consultations.	6
3. Preparation of the concept and development of lighting design.	18

Student's workload

Source of workload	hours	ECTS
Total workload	42	2
Contact hours	24	1
Practical activities	42	2