

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Basic of light engineering and optical radiation		Code 1010321331010324776
Field of study Electrical Engineering	Profile of study (general academic, practical) general academic	Year /Semester 2 / 3
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 30 Classes: - Laboratory: 30 Project/seminars: -		No. of credits 4
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 %) 4 100% 4 100%
Responsible for subject / lecturer: dr inż. Małgorzata Górczewska email: malgorzata.gorczevska@put.poznan.pl tel. 61 665 23 98 Electrical Engineering ul. Piotrowo 3A, 60-965 Poznań		Responsible for subject / lecturer: dr inż. Przemysław Skrzypczak email: przemyslaw.s.skrzypczak@put.poznan.pl tel. 61 665 23 98 Electrical Engineering ul. Piotrowo 3A, 60-965 Poznań
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of visible light, infrared and ultraviolet
2	Skills	The ability to acquire knowledge of the phenomena associated with optical radiation. Basic skills in measuring non-electrical quantities. Ability to effectively self-education in a field related to the chosen field of study.
3	Social competencies	Awareness of the need to expand their competence, ready to work together as a team
Assumptions and objectives of the course: Getting to Know with the basic values of light, lighting elements and principles of assessment and the basics of lighting design. Understanding the nature of optical radiation (thermal, visible and ultraviolet), methods of generation, propagation and detection, the impact of organic and inorganic matter and its applications.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. The student should define the basic concepts of lighting technology, explain rules for the calculation and the measurement of the size of the light; know the parameters of lighting equipment, describe the requirements required for lighting design, formulate laws of optical radiation - [[K_W09 ++, K_W15 +++, K_W17 +++]]		
2. As a result of completion of this course the student should be able to: Describe the construction of solar energy conversion devices including IR and UV and explain their actions - [K_W014 +]		
Skills:		
1. The student will be able to apply his knowledge of lighting technology to carry out computations, measurement and evaluation of performance lighting - [K_U02 +, K_U14 ++]		
2. The student will be able to analyze and evaluate the requirements and make the selection of individual pieces of equipment indoor lighting and outdoor lighting - [K_U23 ++, K_U14 ++]		
3. The student will be able to apply knowledge of optical radiation for basic analysis of systems using optical radiation in the energy sector, surveying, telecommunications, electroheating - [K_U23 ++, K_U12 ++]		
4. The student will be able to recognize the applicability of optical radiation devices in a variety of industrial processes - [K_U23 ++]		
Social competencies:		

1. . Is aware of the importance of the work and their willingness to comply with the principles of teamwork and shared responsibility for the implementation of tasks - [K_K03 +++]
2. Is aware of the need for consistent training - [K_K01 ++]

Assessment methods of study outcomes

Lectures:

- evaluation of the knowledge with a written exam related to the content of lectures (test, computational and problem questions), awarding marks in laboratory exercises)
- continuous estimation in all classes (awarding attendance in lectures, activity and quality of perception).

Laboratory exercises:

- continuous estimating with the tests,
- awarding the skill increase,
- the evaluation of knowledge and skills connected with the measuring tasks and prepared reports

Getting additional points for the activity during classes, in particular:

- the efficiency of the use of acquired knowledge to solve a given problem;
- skill of the co-operation within the team practically realizing a given detailed task in the laboratory;
- remarks connected with the improvement of didactic materials;
- the aesthetic qualities of the reports

Course description

Psychophysiology of view (structure and function of the eye). The basic values the light - definitions, calculation, measurement. Fundamentals of colorimetry. Construction, principle of operation, operating systems, parameters and characteristics of electric lamps: incandescent, HID and LED. Lighting fixtures: design, performance, characteristics, application. Fundamentals of lighting design.

Law and Characteristics of electromagnetic radiation and the optical radiation. Methods for generation of thermal radiation, visible light and UV, propagation and detection. Influence of inorganic matter (thermal effects, lighting and photochemical) and organic (biological effects, subjective feelings). Technical applications of optical radiation (optoelectronic components). Optical radiation as a carrier of information.

Basic bibliography:

1. Żagan W.: Podstawy techniki świetlnej. Ofic. Wyd. Pol. Warszawskiej, Warszawa 2005
2. Hauser J.: Elektrotechnika ? Podstawy elektrotermii i techniki świetlnej, Wyd. PP, Poznań, 2006
3. Laboratorium z techniki świetlnej. Praca zbiorowa. Wyd. Pol. Pozn. nr 1792, Poznań 1989

Additional bibliography:

1. Technika Świetlna '09. Poradnik- Informator. Wyd. PKOś, Warszawa 2009
2. Lighting Handbook, Reference & Application. IES of Nofth America, New York 2010
3. Lighting Standards

Result of average student's workload

Activity	Time (working hours)
1. participation in class lectures	30
2. participation in laboratories	30
3. participate in the consultations on the lectures and laboratory	10
4. preparation to laboratory	20
5. exam preparation	15
6. participation in the exam	3

Student's workload

Source of workload	hours	ECTS
Total workload	108	4
Contact hours	73	3
Practical activities	30	1