

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Electrothermal conversions		Code 1010321361010324817
Field of study Electrical Engineering	Profile of study (general academic, practical) general academic	Year /Semester 3 / 6
Elective path/specialty Lighting Engineering	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: 15 Classes: - Laboratory: - Project/seminars: -		No. of credits 1
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 %) 1 100% 1 100%
Responsible for subject / lecturer: dr hab. inż. Jacek Hauser email: jacek.hauser@put.poznan.pl tel. 61 6652688 Faculty of 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 6652585 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 temperature measurement methods, heat transfer. Knowledge of the physics of phenomena: Conduction, Convection and Radiation.
2	Skills	Use knowledge in physics, electrical engineering and electrothermics
3	Social competencies	He is aware of the need to broaden his knowledge, readiness to search for needed information in the source material, willingness to cooperate within the team.
Assumptions and objectives of the course:		
<ul style="list-style-type: none"> - Identify the amount of heat generated by individual light sources - Determine the main electrothermal path and power flow in the system - Understand the losses occurring in the electrothermal way - Understanding with calculations concerning electromagnetic - thermal and thermokinetic transformations with heat propagation. 		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Knows important from the point of view of heat transfer elements of electrical and electro-lighting systems - [K_W15+++]		
2. Know the main heat transfer way for individual light sources - [K_W16 +++]		
Skills:		
1. On the basis of physical dependencies and material parameters obtained from the literature it is possible to determine the power levels in the main electrothermal way and the loss that - [K_U14+++]		
2. It can distinguish in thermal system an electrothermal way, a place of converting monochromatic energy into useful heat energy - [K_U23+]		
Social competencies:		
1. Can work in a team, demonstrate the ability to coordinate the work of the team - [K_K03+++]		
Assessment methods of study outcomes		
On the basis of individual activity in the classes, diligence and accuracy in the performance of assigned tasks, scoring on the final test (14 weeks of classes), an individual student assessment is made.		

Course description		
<p>lectures</p> <ul style="list-style-type: none"> - lecture with slide presentation on generation of heat and energy balance in various light sources, - lecture conducted in the form of discussion on the influence of temperature on electrical parameters and photometric light sources, - presentation in the form of slides with the preceding content related to the subjects of light technology, covering the subject of the construction of electromagnetic transducers - lecture supported by computational examples of thermal parameters of energy conversion systems - presentation in tabular form with a verbal commentary on the thermal requirements for the electrical components used in the construction of the lighting fixture. <p>Applied methods of education: lectures:</p> <ul style="list-style-type: none"> - lecture with multimedia presentation (including: drawings, photographs, animations, sound, films) supplemented by examples given on the board - an interactive lecture with questions to a group of students or to specific students - Student activity is taken into account during the final assessment - during the lecture, initiating the discussion - theory presented in close connection with practice - theory presented in connection with current knowledge of students - consideration of various aspects of the presented issues, including: economic ones <p>2017 update: introduction of high performance diode sources used as replacements for traditional light sources (retrofit)</p>		
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. Hauser J.: Elektrotechnika. Podstawy elektrotermii i techniki świetlnej. Wydawnictwo Politechniki Poznańskiej, Poznań 2006 2. Michalski L., Eckersdorf K., Kucharski J.: Termometria. Przyrządy i pomiary. Wydawnictwo Politechniki Łódzkiej, Łódź 1998 3. Wesołowski M, Skrzypczak P, Hauser J.: Thermal resistance of LED diodes. Precision of catalogue data. Elektronika 12/2015 s.45-49 		
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. Hering M.: Podstawy elektrotermii cz. I. WNT, Warszawa 1992. 2. Hering M.: Podstawy elektrotermii cz. II. WNT, Warszawa 1998 		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in lectures	15	
2. Participation in consultations (lectures)	5	
3. preparation for the exam	10	
4. participation in the final exam	2	
Student's workload		
Source of workload	hours	ECTS
Total workload	32	1
Contact hours	22	1
Practical activities	0	0