STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Lighting equipment**			Code **1010322231010321040**
Field of study **Electrical Engineering**	Profile of study (general academic, practical) **(brak)**		Year /Semester **2 / 3**
Elective path/specialty **Light Engineering**	Subject offered in: **polish**		Course (compulsory, elective) **obligatory**
Cycle of study: **Second-cycle studies**	Form of study (full-time,part-time) **full-time**		
No. of hours Lecture: **1** Classes: **-** Laboratory: **1** Project/seminars: **1**			No. of credits **5**
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**			ECTS distribution (number and %) **5 100%**

Responsible for subject / lecturer:

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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.

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 &Application. IES of Nofth America, New York 2010

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	15
2. Participation in laboratories	15
3. Participation in project activities	15
4. Participation in consultations	20
5. Preparation for laboratory and project exercises and develop reports	30
6. Exam preparation	30

Student's workload

Source of workload	hours	ECTS
Total workload	125	5
Contact hours	65	3
Practical activities	60	3