COURSE DESCRIPTION CARD

The name of the course/module **LIGHTING PROJECT**		Code **A_P_1.6_012**
Main field of study **ARCHITECTURE**	Educational profile (general academic, practical) **general academic**	Year/ Semester **III/6**
Specjalization **-**	Language of course: **Polish**	Course (core, elective) **elective**
Hours Lectures: - Classes: **-** Laboratory classes: **-** Projects / seminars: **30**		Number of points **1**

Level of qualification: **I**	**Form of studies** (full-time studies/part-time studies) **Full-time studies**	Educational area(s) **Technical Sciences**	ECTS distribution (number and %) **1** **100%**

Course status in the studies' program (basic, directional, other) **directional**	(general academic, from a different major) **-**

Lecturer responsible for course:

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Prerequisites defined in terms of knowledge, skills, social competences:

1	**Knowledge:**	• student has explicit, theoretically based knowledge including the key issues of light technique, • student has basic knowledge of the role and importance of artificial lighting in the architectural designing and urban planning, • student has knowledge required for the understanding of social, economic, legal and other determinants outside the engineering field of the realization of artificial lighting systems in the life areas and functioning of the human,
2	**Skills:**	• student can acquire information from field specific literature, data bases and other properly selected sources in Polish and English, can integrate the acquired information, interpret and critically assess the said information, as well as draw conclusions and come up with opinions supported with satisfactory reasons, • student can carry out critical analysis of the manner of operation and assess the existing solutions, systems and processes, • can communicate using different IT tools in the professional environment and in other environments,
3	**Social competences:**	• student understands the need for lifelong learning; can inspire and organize process of learning other people, • understanding of the need to broaden the competences, readiness to work together in a group,

Objective of the course:

- knowledge of formal and legal conditions of architectural illumination,
- knowledge of preparation stages of illumination concept and importance of architectural and urban planning analysis in process of concept creation,
- knowledge of basic tools and techniques for preparation of technically correct illumination concept,
- knowledge of computer environments supporting the design of electric (artificial) lighting,
- obtain the ability to creation of basic technical documentation of illumination project exemplified by selected architectural facility with particular emphasis of executive technical drawings,
- obtain knowledge and the ability to designing the illumination systems.

Learning outcomes

Knowledge:

W01	has knowledge required for the understanding of social, economic, legal and other determinants outside the engineering field of the engineering activities and has basic knowledge of quality management	AU1_W01

W02	has basic knowledge connected with professional ethics of an architect	AU1_W04
W03	has basic knowledge of mathematics, descriptive geometry, the theory of structures, strength of materials and building physics,	AU1_W06
Skills:		
U01	student can acquire information from field specific literature, data bases and other properly selected sources in Polish and English, can integrate the acquired information, interpret and critically assess the said information, as well as draw conclusions and come up with opinions supported with satisfactory reasons,	AU1_U01
U02	student can prepare and present oral presentations on issues related to architectural and urban lighting	AU1_U03
U03	can work individually and in a team, in this can organise his/her time properly as well as can undertake liabilities and meet the deadlines	AU1_U04
U05	can, when formulating engineering tasks and solving them, notice their social, historical, economic and legal aspects	AU1_U16
Social competences:		
K01	can work over a set task independently and can cooperate in a team, assuming a number of different roles therein; demonstrates responsibility in the work performance	AU1_K01
K02	student is aware of the importance of non-technical aspects and effects of engineering activities, in this impact upon the cultural environment and liability for environment affecting decisions	AU1_K05
K03	understands the need of continuous self-education (1st and 2nd degree studies, post-graduate studies) - improvement of professional, personal and social competences	AU1_K03

The evaluation methods:

Conditions for course credit and evaluation method. An important criterion of project assessment will approach to the following issues:

1. The architectural, urban, historical and lighting analysis as a basis for initial illumination concept.
2. Preliminary visual concept of architectural facility illumination.
3. Technical conditions proposed in concept – modification of preliminary assumptions.
4. Lighting calculation – concept modification and/or illumination methods.
5. Light color and luminance as means of expression in illumination.
6. Correctness study of selected technical solutions (e.g. from the point of view of glare occurrence)
7. Study and verification of lighting levels on facility facades in individual stages of project.

Formative assessment:

Partial reviews checking the progress of student work – individual consultation, brainstorm, common discussion; review of student work progress 7 times in a semester (every classes), obtained 5 positive assessments is a condition of course credit.

Summative assessment:

Final review after last classes – credit of design solutions presenting in the forum of group on the basis of substantive content of elaboration according to scheme and boards in the standardized A2 format.

Final grading scale: 2.0, 3,0; 3,5; 4,0; 4,5; 5,0

Positive grade for module depends on achieved by student all learning outcomes specified in the syllabus.

Course contents

Development of illumination concept of selected, determined with the teacher the architectural facility, which fulfill formal criteria.

Analytical (individual) part:

- localization of the facility, its cubature, style and architectural detail, observation conditions (directions and distances), historical context as a basic analyses necessary to create the design concept of architectural facility illumination.
- analysis of current state of facility lighting,
- analysis of lighting equipment, pre-selected to illumination,
- analysis of assembly possibilities of selected lighting equipment in the urban space.

Design part:

Design work is individual and covers the implementation of technical documentation of illumination project of selected architectural facility on the basis of calculation, simulation and visualization of facility lighting in DIALux software. The project should include the following components:

descriptive (analysis, selection of illumination method, characteristics of illuminated detail)

technical (equipment solutions, location and targeting for lighting equipment).

Basic bibliography:

1. Bąk Jerzy, Pabjańczyk Wiesława, *Podstawy techniki świetlnej*, Nakład Politechniki Łódzkiej, Łódź 1994.
2. Hauser Jacek, *Elektrotechnika. Podstawy elektrotermii i techniki świetlnej*, Wydawnictwo Politechniki Poznańskiej 2006.
3. Mielicki Józef, *Zarys wiadomości o barwie*, Fundacja Rozwoju Polskiej Kolorystyki, Łódź 1997.
4. Technika Świetlna '96 Poradnik-Informator, Praca zbiorowa członków Polskiego Komitetu Oświetleniowego Stowarzyszenia Elektryków Polskich, Warszawa 1996.
5. Żagan Wojciech, *Podstawy techniki świetlnej*, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2005.
6. Żagan Wojciech, *Iluminacja obiektów*, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2003.
7. PN-EN 12193:2002 (U) Oświetlenie stosowane w obiektach sportowych
8. PN-EN 1838:2005 Zastosowanie oświetlenia. Oświetlenie awaryjne.
9. PN-EN 12665:2003 (U) Światło i oświetlenie. Podstawowe terminy oraz kryteria określania wymagań dotyczących oświetlenia.
10. PN-EN 13032-1:2005 (U) Światło i oświetlenie. Pomiar i prezentacja danych fotometrycznych lamp i opraw oświetleniowych. Część 1: Pomiar i format pliku.
11. PN-EN 13032-2:2005 (U) Światło i oświetlenie. Pomiar i prezentacja danych fotometrycznych lamp i opraw oświetleniowych. Część 2: Prezentacja danych dla miejsc pracy wewnątrz i na zewnątrz budynków.
12. PN-CEN/TR 13201-1:2005 (U) Oświetlenie dróg. Część 1: Wybór klas oświetlenia.
13. PN-EN 13201-2:2005 (U) Oświetlenie dróg. Część 2: Wymagania oświetleniowe.
14. PN-EN 13201-3:2005 (U) Oświetlenie dróg. Część 3: Obliczenia oświetleniowe.
15. PN-EN 13201-4:2005 (U) Oświetlenie dróg. Część 4: Metody pomiarów parametrów oświetlenia.
16. PN-IEC 60364 Instalacje elektryczne w obiektach budowlanych (norma wieloarkuszowa).
17. Ustawa Prawo Energetyczne z dnia 10 kwietnia 1997 r. (Dz. U. z 1997 r. Nr 54, poz. 348 z późniejszymi zmianami).
18. Zalecenia i wytyczne projektowe w zakresie luminancji i barwy w iluminacji

Supplementary bibliography:

1. Majkowski Konstanty, *Podstawy teoretycznej techniki oświetleniowej,* Państwowe Wydawnictwo Naukowe, Warszawa 1953.
2. Nawrowski A., *Dominanty świetlne w iluminacji wybranych obiektów architektonicznych*, Rozprawa Doktorska, Poznań: Politechnika Poznańska, 2010.
3. Oleszyński T., *Miernictwo techniki świetlnej*, PWN, Warszawa 1957.
4. Tomczewski Andrzej, Rozprawa doktorska *„Analiza rozkładu strumienia świetlnego we wnętrzach z uwzględnieniem wielokrotnych odbić",* Poznań, grudzień 1998.

The student workload

Form of activity	Hours	ECTS
Overall expenditure	31	1
Classes requiring an individual contact with teacher	15	
Practical classes	16	

Balance the workload of the average student

Form of activity	Number of hours
participation in lectures	**-**
participation in classes/ laboratory classes (projects)	**30 h**
preparation for classes/ laboratory classes	**-**
preparation to colloquium/review	**-**
participation in consultation related to realization of learning process	**1 x 1 h = 1 h**

preparation to the exam	**-**
attendance at exam	**-**

Overall expenditure of student: 1 **ECTS credits** **31 h**
As part of this specified student workload

- activities that require direct participation of teachers:
  30h + 1h = **31 h**