



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Electrical installation systems in buildings

### Course

Field of study

Electrical power engineering

Area of study (specialization)

-

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

0

Tutorials

0

Projects/seminars

30

### Number of credit points

4

### Lecturers

Responsible for the course/lecturer:

Grzegorz Dombek, Ph. D., Eng.

Responsible for the course/lecturer:

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### Prerequisites

Basic knowledge of electrical devices and installations. Knowledge of the principles of safe use of electrical equipment. Knowledge of the operation and use of installation protections.

### Course objective

Gaining knowledge and skills in the construction, design and testing of electrical installation systems. Understanding how to distribute power, create comprehensive surge protection and build lightning protection systems, computer and telecommunications networks.



### Course-related learning outcomes

#### Knowledge

Student knows the rules for the selection of electrical and information and communications ICT equipment used in electrical installation projects. Student considers phenomena accompanying interference processes at the design stage of electrical installation systems.

#### Skills

Student is able to design building electrical installations for various purposes. Student can choose the equipment of electrical and teletechnical installations. Student is able to interact with designers of other installation systems and users of buildings.

#### Social competences

Student is aware of the principles of professional ethics when designing surveillance systems in buildings. Student responsibly plans tasks respecting the rights of other designers and users of buildings.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

#### Lecture:

- knowledge acquired as part of the lecture is verified by a written final exam consisting of open or test questions with different points. Passing threshold: 50% of points,
- current grading in each lecture (rewarding activities).

#### Laboratory classes:

- current check and rewarding knowledge necessary for the accomplishment of the problems in the area of laboratory tasks,
- evaluation of reports performed on laboratory classes,
- rewarding activities related to the implementation of laboratory classes.

#### Projects:

- the preparation of materials for the project is evaluated,
- substantive preparation for the implementation of the assigned project is evaluated,
- project and its defense are evaluated.

### Programme content

#### Lecture:

Electrical and teletechnical installations in buildings. Legal and normative requirements for electrical and teletechnical installations. Electrical and teletechnical installations distribution systems. Types and functions of electrical installation equipment components. Safety devices in electrical and teletechnical



installations. Overvoltage, shock and overcurrent protection elements. Control methods and measuring devices used in testing electrical and teletechnical installations.

Laboratory classes:

Classes discussing the regulations of the laboratory, topics of laboratory classes and OHS training related to the operation of laboratory positions. To perform 6 two-hour laboratory classes in the field of lecture.

Projects:

Assigned elective project to be implemented in the field of electrical installation systems in buildings including output data, design diagrams, replacement diagrams and technical calculations.

### Teaching methods

Lecture:

- multimedia or object-oriented presentations supported by illustrated examples presented on the board,
- interactive lecture with questions and initiating discussions.

Laboratory classes:

- object-oriented presentations supported by illustrated examples presented on the board,
- presentations of selected experiments,
- initiating teamwork.

Projects:

- use of dedicated or developed computer applications, graphic programs and catalogs of producers of electrical equipments, teletechnical, building automation and alarm systems.

### Bibliography

Basic

1. Markiewicz H., Instalacje elektryczne, WNT, Warszawa, 2018.
2. Strzałka, J. Instalacje elektryczne i teletechniczne: poradnik monterów i inżynierów elektryków. Obliczenia, projektowanie, montaż, eksploatacja. T. 1-4, Verlag Dashofer, 2001.
3. Waliszewski, W. Instalacje elektryczne w praktyce, Wiedza i Praktyka, 2014.
4. Skibko, Z. Budowa oraz eksploatacja instalacji i urządzeń elektrycznych, Oficyna Wydawnicza Politechniki Białostockiej, Białystok, 2019.
5. Lejdy, B.; Sułkowski, M. Instalacje elektryczne w obiektach budowlanych, PWN, Warszawa, 2019.



6. Niestępski, S.; Parol, M.; Pasternakiewicz, J.; Wiśniewski, T. Instalacje elektryczne: budowa, projektowanie i eksploatacja, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2019.

7. Wincencik, K. Ochrona odgromowa według nowych Polskich norm, Wydawnictwo Wiedza i Praktyka, Warszawa, 2018.

#### Additional

1. Praca zbiorowa, Switchgear manual, ABB Schaltanlagen GmbH, Mannheim, Federal Republic of Germany, 11-th editions 2006.

2. Skibko, Z. Low-voltage electrical installations, Oficyna Wydawnicza Politechniki Białostockiej, Białystok, 2019.

3. Parol, M.; Rokicki, Ł. Instalacje i systemy w inteligentnych budynkach: laboratorium, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2017.

4. Dombek, G.; Nowak, K.; Książkiewicz, A.; Bochenek, B.; Nowaczyk, P.; Pluta, P. Zastosowanie przekaźników PLC do realizacji algorytmów sterowania ogrzewaniem. Poznan University of Technology Academic Journals. Electrical Engineering, 2017, Issue 92, pp.415-425.

5. Dombek, G.; Książkiewicz, A.; Janiszewski, J. Electrodynamic contact bounce induced by fault current in low-voltage relays. Energies, 2018, vol. 12, no. 20, pp. 3926-1-3926-13.

6. Normy przedmiotowe.

7. Publikacje internetowe.

#### Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	60	2,5
Student's own work (literature studies, preparation for laboratory classes, preparation of reports, preparation for projects, project preparation, preparation for final exam) <sup>1</sup>	40	1,5

<sup>1</sup> delete or add other activities as appropriate