COURSE DESCRIPTION CARD - SYLLABUS

Course name
Electrical load profile of urban and industrial facilities

Course

Field of study
Electrical power engineering
Year/Semester
1/2
Area of study (specialization)
Electric energy exploitation
Profile of study
general academic
Level of study
Second-cycle studies
Course offered in
polish
Form of study
full-time
Requirements
elective

Number of hours

Lecture
15
Laboratory classes
15
Other (e.g. online)
0
Tutorials
0
Projects/seminars
0

Number of credit points

2

Lecturers

Responsible for the course/lecturer:
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Responsible for the course/lecturer:
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Prerequisites

Basic information on the functioning of electrothermal, lighting and drive devices. Knowledge of the operation of installation security and building automation elements. Ability to create and analyze electrical diagrams. Ability to perform basic electrical measurements.

Course objective

Obtaining extended knowledge in the field of issues related to the demand for electricity in urban and industrial facilities. Expanding knowledge in the field of knowledge of the operational features of electrothermal, lighting and drive devices. Acquisition of skills necessary to implement power supply

projects for these facilities. The ability to assess the impact of receivers on the quality parameters of electricity in supply circuits.

Course-related learning outcomes

Knowledge

Student has in-depth knowledge of the operational characteristics of power supply circuits in municipal and industrial facilities. Student knows the operation of receiving devices (electrothermal, lighting, driving) in the use of electrical engineering laws. Student knows the areas of use of heating, lighting and drive systems in industrial and urban facilities.

Skills

Student is able to perform basic research related to the operation of electrothermal, lighting and propulsion devices and the related safety of their use. Student is able to determine the demand for electricity for receiving devices and to design their supply and protection circuits. Student has the ability to optimally select the receiving devices that constitute the equipment of municipal and industrial facilities.

Social competences

Student is aware of the principles of professional ethics in the design of power circuits for receiving devices in buildings. Student 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 laboratoy classes.

Programme content

Lecture:

Issues related to the demand for electricity in urban and industrial facilities. Energy consumption of lighting and electrothermal devices. Acquisition of data from energy consumption. Profiling of recipients. The quality of energy in receiving circuits and its influence on the operation of receivers. Improving the power factor in load circuits. Elements of designing power supply and energy distribution

in industrial plants. Designing power supply for municipal consumers in terms of specification of their equipment.

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.

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-orientedpresentations supported by illustrated examples presented on the board,

- presentations of selected experiments,

- initiating teamwork.

Bibliography

Basic

1. Hauser, J. Podstawy elektrotermii i techniki świetlnej, Wydawnictwo Politechniki Poznańskiej, 2006 r.

2. Rodacki, T., Kandyba, A. Urządzenia elektrotermiczne, Wydawnictwo Politechniki Śląskiej, 2002 r.

3. Marzecki, J. Sieci elektroenergetyczne w obiektach przemysłowych. Wybrane zagadnienia. Oficyna Wydawnicza Politechniki Warszawskiej, 2015 r.

4. E. Niezabitowska, J. Sowa, Z. Staniszewski, D. Winnicka-Jasłowska, W. Badroń, A. Niezabitowski. Budynek inteligentny. Potrzeby użytkownika a standard budynku inteligentnego. Wydawnictwo Politechniki Śląskiej, Gliwice, 2000.

5. J. Mikulik. Budynek inteligentny. Podstawowe systemy bezpieczeństwa w budynkach inteligentnych. Wydawnictwo Politechniki Śląskiej, Gliwice, 2000.

6. A. Kamińska A, L. Muszyński, Z. Boruta, R. Radajewski, Nowoczesne techniki w projektowaniu energooszczędnych instalacji budynkowych w systemie KNX, POIG.02.02.00-00-018/08-00, Warszawa 2011.

Additional

1. Strzelecki, R.; Sypronowicz, H. Filtracja harmonicznych w sieiach zasilających prądu przemiennego, Polska Akademia Nauk, 1998 r.

2. Rodacki, T,; Kandyba, A. Urządzenia elektrotermiczne, Wydawnictwo Politechniki Śląskiej, 2002 r.

3. Toulouevski, Y.N.; Zinurov, I.Y. Innovation in electric arc furnaces, Springer, 2013 r.

4. Karbowniczek, M. Electric arc furnace steelmaking, Taylor and Francis Group, 2021 r.

5. Muhlbauer, A. History of induction heating and melting, Vulkan Verlag, 2008 r.

6. 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 Enginnering, 2017, Issue 92, pp.415-425.

7. Normy przedmiotowe.

8. Publikacje internetowe.

Breakdown of average student's workload

	Hours	ECTS
Total workload	55	2,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for laboratory classes, preparation of reports, preparation for final test [1]	25	1,0

[1] delete or add other activities as appropriate