COURSE DESCRIPTION CARD - SYLLABUS

Course name
Intelligent building management systems

Course

Field of study
Electrical Engineering

Year/Semester
2/3

Area of study (specialization)
Distribution Devices and Electrical Installations

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
30

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
Grzegorz Dombek, Ph. D., Eng.

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Responsible for the course/lecturer:

Prerequisites

Basic knowledge of control algorithms, automation, computer science, electrical devices and installations. Ability to analyze the operation of simple electrical systems and read electrical diagrams. Awareness of the need to expand their competences, readiness to cooperate within a team.

Course objective

Understanding the principles and possibilities of controlling building installations, aimed at saving energy and increasing the comfort of using the facility. The acquisition of basic skills in the development of Building Automation Systems BAS, security systems SMS and their integration BMS. The acquisition of software skills and testing of simple building installations.

Course-related learning outcomes

Knowledge

Student knows the basic principles of operation, implementation and software of selected building automation systems. Student knows the principles of operation and design of building security systems: Intrusion Alarm System, Fire Alarm System, Access Control, CCTV. The student knows the general principles of integration of BAS and SMS systems.

Skills

Student is able to develop ways of controlling selected installations and devices, and properly select controllers that allow the implementation of this control. Student is able to choose security systems and their configuration depending on specific features of the object. Student is able to program and test the operation of a fragment of the building automation system installation and develop integration with the selected building protection system.

Social competences

Student is aware of the need to use and develop building automation systems for energy saving purposes and to increase the comfort and safety of using the facility. Student is able to work in a team that comprehensively develops controlled electrical installations.

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 test 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:

Characteristics of building automation systems. Wired building automation systems - basic information, lighting control, heating, blinds/shutters. Wireless building automation systems - basic information, lighting control, heating, blinds/shutters. Security systems in buildings.

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. 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.

2. PN-EN 15193-1:2017-08. Efektywność energetyczna budynków. Wymagania energetyczne dotyczące oświetlenia. Część 1

3. 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.

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

5. Code of practice. Building Automation and Control Systems. The Institution of Engoneering of Technology. 2020.

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.

Additional

1. PN-EN 50131-1:2009. Systemy alarmowe -- Systemy sygnalizacji włamania i napadu -- Część 1: Wymagania systemowe.

2. J. Ciszewski, Wstęp do automatycznych systemów sygnalizacji pożaru, Centrum Naukowo-Badawcze Ochrony Przeciwpożarowej, Józefów, 1996.

Breakdown of average student's workload

	Hours	ECTS
Total workload	88	3,0
Classes requiring direct contact with the teacher	45	1,5
Student's own work (literature studies, preparation for laboratory classes, preparation of reports, preparation for tests) [1]	43	1,5

[1] delete or add other activities as appropriate