COURSE DESCRIPTION CARD - SYLLABUS

Course name
Intelligent building

Course

Field of study
Electrical Engineering

Year/Semester
2/3

Area of study (specialization)
Electrical and Computer Systems in Industry and Vehicles

Profile of study
general academic

Level of study
Second-cycle studies

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars
15

Number of credit points

4

Lecturers

Responsible for the course/lecturer:
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Faculty of Control, Robotics and Electrical Engineering

Piotrowo 3A, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Basic knowledge in the field of electrical engineering, electronics and computer science, including in building installations. Ability to understand and interpret knowledge provided in class. The ability to effectively self-study in a field related to the chosen field of study. Awareness of the need to expand their competences, readiness to cooperate within a team.

Course objective

Extended knowledge of theoretical and practical problems related to the construction of elements, sub-assemblies and systems of modern intelligent buildings and alarm systems.

Course-related learning outcomes

Knowledge

1. has structured and theoretically founded knowledge of the design of electrical devices and systems, taking into account their impact on the environment,

2. knows the construction and operation principles of basic systems and devices in buildings, as well as the principles of preparing the methodology for designing selected installations,

3. has basic and systematic knowledge in the field of design and programming of microprocessor systems and PLC controllers used in industrial process control.

Skills

1. knows how to apply knowledge of the cooperation of electrical and IT systems in buildings with their other installations in order to prepare technical documentation,

2. is able to obtain information from literature and the Internet, work individually, independently solve tasks in the field of theory of analysis and design of systems and devices in construction.

Social competences

1. is able to think and act in an entrepreneurial manner in the field of analyzing systems and systems in buildings.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired during the lecture is verified by an exam lasting about 45-60 minutes, consisting of 10-15 questions (open and close guestions), variously scored. Passing threshold: 50% of points. The issues on the basis of which questions are prepared will be sent to students by e-mail using the university's e-mail system.

Project classes are assessed on the basis of: checking and rewarding knowledge necessary to implement the problems posed in a given area of project tasks, assessing continuous activity in each class, rewarding the increase in the ability to use known principles and methods, assessment of knowledge and skills related to the implementation of the project task.

Obtaining additional points for activity during classes, and in particular for: proposing discussion of additional aspects of the issue, effectiveness of applying the acquired knowledge when solving a given problem, comments related to the improvement of teaching materials, aesthetic care of the developed tasks within self-study.

Programme content

Lecture:

Standards for electrical engineering, IT, telecommunications and electromagnetic compatibility in intelligent buildings and alarm systems. Principles of control and system design in intelligent buildings. Development trends of information transfer and control in intelligent buildings. Classes at the university

are supplemented with materials enabling independent preparation for classes and extending the knowledge.

Projects:

Designing building systems in the intelligent building laboratory, including building installations and equipment. Cooperation of various types of control panels with modern components (e.g. touch panel, alarm system, remote access) extending the functionality of building systems. Issues of alarm systems. Examples of implementation.

Teaching methods

Lecture: multimedia presentations containing drawings, diagrams, photos, supplemented with practical examples on the board, slides and computer programs, which makes it easy to link theory and practice. The lecture supplemented with additional materials provided to students for independent study. Utilizing students 'knowledge of other subjects, initiating discussions, asking questions to increase students' activity and independence.

Projects: The use of computer hardware with a dedicated programming environment to learn the design and programming of various installations and their functionalities in intelligent buildings. Teamwork on various design tasks.

Bibliography

Basic

1. Niezabitowska E., Budynek Inteligentny, t. I-II, Potrzeby użytkownika a standard budynku inteligentnego, Wydawnictwo Politechniki Śląskiej, Gliwice, 2010.

2. Nawrocki W., Sensory i systemy pomiarowe, Wydawnictwo Politechniki Poznańskiej, Poznań, 2006.

3. Niezabitowska E., Budynek Inteligentny, t. II, Podstawowe systemy bezpieczeństwa w budynkach inteligentnych, Wydawnictwo Politechniki Śląskiej, Gliwice, 2010.

4. Patykiewicz P., Nowoczesna instalacja elektryczna w inteligentnym budynku, COSiW SEP, Warszawa 2001.

5. Stanisławek R., Integracja systemów bezpieczeństwa w obiekcie, Systemy Alarmowe, 2002.

Additional

1. Markiewicz H., Instalacje elektryczne, Wydawnictwo Naukowo-Techniczne, Warszawa, 2006.

2. Borkowski P. i inni, Podstawy integracji systemów zarządzania zasobami w obrębie obiektu, Wydawnictwo Naukowo-Techniczne Sp.z.o.o, Warszawa, 2009.

3. Wang S., Intelligent Buildings and Building Automation, Spon Press, Nowy Jork, 2010.

4. Pilich B, Engineering Smart Houses, Lyngby, 2004.

5. Nowak R., Pietrasz A., Trzmiel G., The control and visualisation system in an intelligent building, ITM Web Conf., vol. 19 (01041), 2018, https://doi.org/10.1051/itmconf/20181901041.

6. Głuchy D., Kurz D., Trzmiel G., Aspekty projektowania i eksploatacji systemów przeciwpożarowych w obiektach przemysłowych, Computer applications in electrical engineering vol. 79/2014, Poznan University of Technology Academic Journals - Electrical Engineering, Poznań, 2014, str. 149 - 156.

7. Głuchy D., Jarmuda T., Kurz D., Skowronek K., Trzmiel G., Współpraca systemu fotowoltaicznego z układem zasilania w energię w budynku inteligentnym, INPE - Informacje o normach i przepisach elektrycznych nr 152, Poznań, maj 2012, str. 67-73.

8. Głuchy D., Kurz D., Trzmiel G., Energy consumption by the teletask building management system, CPEE 15th International Workshop Computational Problems of Electrical Engineering, 9-12.09.2014, Terchova, Słowacja, pp. 41.

9. Internet: specialist subject literature, datasheets, standards.

Breakdown of average student's workload

	Hours	ECTS
Total workload	95	4,0
Classes requiring direct contact with the teacher	50	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	45	2,0

[1] delete or add other activities as appropriate