STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Intelligent building	**1010322331010326003**

Field of study	Profile of study (general academic, practical)	Year /Semester
Electrical Engineering	**(brak)**	**2 / 3**
Elective path/specialty: **Electrical and Computer Systems in**	Subject offered in: **Polish**	Course (compulsory, elective): **obligatory**
Cycle of study: **Second-cycle studies**	Form of study (full-time,part-time): **full-time**	

No. of hours	No. of credits
Lecture: **15** Classes: **-** Laboratory: **-** Project/seminars: **15**	**4**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**4 100%**
Technical sciences	**4 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of electrical engineering, electronics and information technology, including building installations.
2	**Skills**	The ability to understand and interpret knowledge transmitted in the classroom. The ability to effectively self-education in a field related to the chosen field of study.
3	**Social competencies**	The awareness of the need to expand their competence, their willingness to cooperate within the team.

Assumptions and objectives of the course:

Advanced knowledge of theoretical and practical problems associated with the construction components, subassemblies and systems for modern buildings "smart" and alarm systems.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. He has ordered and theoretically founded knowledge in the design of electrical equipment and systems including their impact on the environment - [K_W05++]
2. characterize the structure and principles of basic systems and equipment in buildings and prepare design methodology selected installations - [K_W08+]

Skills:

1. use knowledge of electrical systems of cooperation and information in buildings with their other systems for the preparation of technical documentation - [K_U03++, K_U10+]
2. obtain information from the literature and the Internet, work individually and independently solve problems in the theory of analysis and design of systems and equipment in construction - [K_U08++]

Social competencies:

1. able to think and act in an entrepreneurial manner in the area of systems analysis and systems in buildings - [K_K01+]

Assessment methods of study outcomes

Lectures:

- Assess the knowledge and skills shown on the written test.

Class Projects:

- Test and rewarding knowledge necessary for the accomplishment of the problems in the area of project tasks,
- Continuous assessment for each course - rewarding the increase in the ability to use principles and methods have met.
- Assess the knowledge and skills related to the implementation of the project tasks.

Get extra points for activity in the classroom, and in particular for:

- Proposing to discuss additional aspects of the subject,
- The effectiveness of applying knowledge when solving a given problem,
- Comments relating to the improvement of teaching materials,
- Developed aesthetic care tasks - as part of self-study.

Course description

Applied methods of teaching: lectures: 15 h., projects: 15 h.

The lecture is characteristic of SCADA systems with a special focus the practical aspects of the principles of operation, configuration, and operation of selected components. Within the expanded project activities is realized within the theme of the course for full-time undergraduate (1st degree) studies, mainly for co-operation the system with real PLC. The focus is directed to present possibilities, principles and universality of exchange of information between the SCADA system and any PLC.

Project: Individual/team project based on PLC and SCADA software cooperation. Performing the design for the project.

Use students' knowledge of other subjects, initiate discussions, ask questions to increase student activity and autonomy.

Use of software to enable students to perform home tasks (DEMO mode with virtual drivers and real simulation). Classes at the university supplemented by materials for self-employment on free software packages.

Updated 2017: Working on the latest version of Citect SCADA 2016 software, introducing modern application solutions used in practice.

Basic bibliography:

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.

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

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

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

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

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

Additional bibliography:

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. Piasecki A., Trzmiel G., Remote building control using the bluetooth technology, Monograph Computer Applications in Electrical Engineering, Poznan University of Technology 2016, vol. 14, pp. 457 ? 468.

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 ? Computational Problems of Electrical Engineering, 9-12.09.2014, Terchova, Słowacja, pp. 41.

9. Diploma papers.

10. www.satel.pl

11. Internet.

Result of average student's workload	
Activity	**Time (working hours)**
1. participation in class lecture	15
2. participation in class of project	15
3. consultation on the lecture	10
4. consultation on the project	10
5. preparation for the exam	15
6. exam	2
7. preparation for projects	30

Student's workload		
Source of workload	**hours**	**ECTS**
Total workload	97	4
Contact hours	52	2
Practical activities	35	1