STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Intelligent building**		Code **1010324391010306003**
Field of study **Electrical Engineering**	Profile of study (general academic, practical) **general academic**	Year /Semester **5 / 9**
Elective path/specialty **Electrical and Computer Systems in**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **part-time**	

No. of hours				No. of credits
Lecture: **9** Classes: **-** Laboratory: **-** Project/seminars: **18**				**3**

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

Education areas and fields of science and art **technical sciences** **Technical sciences**	ECTS distribution (number and %**)** **5 100%** **5 100%**

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 systems.
2	**Skills**	The ability to understand and interpret knowledge conveyed in the classroom. Ability to effectively self-education in a field related to the chosen field of study.
3	**Social competencies**	Is aware of the need to broaden their competence, willingness to work together as a team.

Assumptions and objectives of the course:

In-depth knowledge of the theoretical and practical problems associated with the construction of components, subassemblies and systems of modern buildings "smart".

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

Knowledge:

1. Describe the construction and operation of the basic elements and components of microprocessor and electrical equipment in buildings and prepare the selected system design methodology - [K_W08 +, K_W10++]

2. Explain the operation of building energy systems, microprocessor and computer - [K_W14+]

Skills:

1. Apply the knowledge in the scope of electric and computer theories of arrangements in buildings in order to carry documentation out of performance of a task engineering - [K_U07+++, K_U12+]

2. Obtain information from the literature and the Internet, work individually, independently solve problems in the theory of analysis and design of systems and equipment in the construction industry - [K_U17++]

Social competencies:

1. Able to think and act in an entrepreneurial manner in the area of systems analysis and systems in buildings - [K_K04++]

Assessment methods of study outcomes

Lecture:

- assess the knowledge and skills listed on the completion of the writing.

Exercise Design:

- test and favoring knowledge necessary for the accomplishment of the problems in the area of design tasks,

- continuous evaluation for each course - rewarding gain skills they met the principles and methods,

- assessment of knowledge and skills related to the implementation of the project tasks.

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

- propose to discuss additional aspects of the subject,

- the effectiveness of the application of the knowledge gained during solving the given problem,

- subsequent to the improvement of teaching materials,

- developed aesthetic care tasks - in the self-study.

Course description

Applied methods of education:

Lecture: Historical Overview. International Standards of building automation. Ways to transfer information in intelligent buildings - EIB (European Installation Bus) / KNX, philosophy, components, operation, alternative ways to transfer information in intelligent buildings. The structure of the installation ? BMCS (Building Management and Control System). The economics of building installations. Lecture with multimedia presentation (including: drawings, photos) run in an interactive way with the formulation of questions to a group of students, theory presented in close association with practice.

Project: Implementation of the goals set design mockups on a real chosen system in the laboratory. Analysis / discussion of various methods (including nonconventional) problem solving, group work.

Update 2017: Methods and modes of monitoring and temperature control based on building automation; Z-Wave technology.

Basic bibliography:

1. Niezabitowska E.: Budynek inteligentny. Tom I: Potrzeby użytkownika a standard budynku inteligentnego, Wyd. Politechniki Śląskiej, Gliwice 2014.

2. Mikulik J.: Budynek inteligentny. Tom II: Podstawowe systemy bezpieczeństwa w budynkach inteligentnych, Wyd. Politechniki Śląskiej, Gliwice 2014.

3. Mikulik J.: Inteligentne budynki: Teoria i praktyka, Kraków: Oficyna Wydawnicza, 2010.

4. Nawrocki M.: ?Europejska magistrala instalacyjna EIB?.

5. Kurz D.: Porównanie systemów automatyki budynkowej dla domu jednorodzinnego, Poznan University of Technology Academic Journals. Electrical Engineering, vol. 92, 2017, Poznań, Polska, str. 365 ? 373

6. Horyński M., Majcher J.: Automatyka budynkowa jako element bezpieczeństwa, TTS TECHNIKA TRANSPORTU SZYNOWEGO, 2016, nr 12, s. 425-428

7. Głuchy D., Kurz D., Trzmiel G.: Energy consumption by the Teletask Building Management System, XV International Conference CPEE ? Computational Problems of Electrical Engineering, 9 ? 12 wrzesień 2014, Terchová - Vrátna dolina, Slovak Republic, pp. 41 ? 41

8. Horyński M.: Inteligentne instalacje budynkowe a sprawa polska, NAPĘDY I STEROWANIE - MIESIĘCZNIK NAUKOWO-TECHNICZNY, 2013, nr 12, s. 78-81

9. Horyński M., Styła S.: Intelligent control for HVAC devices in LCN system, TEKA KOMISJI MOTORYZACJI I ENERGETYKI ROLNICTWA PAN,2013, nr 1, vol. 13, s. 57-63

Additional bibliography:

1. Borkowski P.: Podstawy integracji systemów zarządzania w obrębie obiektu, WNT, 2009.

2. http://www.knx.org

3. http://www.emiter.net

4. http://www.smartech.com.pl

5. Prace dyplomowe IEiEP.

6. Czasopismo ?Inteligentny budynek?

7. Horyński M., Pietrzyk W.: Współpraca komponentów inteligentnego budynków sterowaniu oświetleniem, TEKA KOMISJI MOTORYZACJI I ENERGETYKI ROLNICTWA PAN, 2011, vol. 11, s. 135-142

Result of average student's workload

Activity	Time (working hours)

1. Participation in lecture classes	9
2. Participation in design classes	18
3. Participation in consultation concerning the lecture	3
4. Participation in consultation concerning the project	3
5. Preparation for the test/exam	33
6. Test/exam	3
7. Preparing the design description	20

Student's workload

Source of workload	hours	ECTS
Total workload	89	3
Contact hours	36	1
Practical activities	41	2

http://www.put.poznan.pl/