



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Techniques of property monitoring and security [S1Elmob1>PO11-TMiZM]

### Course

Field of study

Electromobility

Year/Semester

4/7

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

elective

### Number of hours

Lecture

15

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

15

### Number of credit points

3,00

### Coordinators

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### Lecturers

### Prerequisites

Knowledge of mathematical analysis, circuit theory, basics of signal processing, programming. Able to perform calculations resulting from the theory of circuits and verify their results, is able to operate computer programs and network communication tools. Can work and interact in a group.

### Course objective

Expanded knowledge of theoretical and practical problems related to the construction of elements, components and systems of modern property and people security - in terms of protection of vehicles and places related to their production, storage and operation. To familiarize students with monitoring, access control and fire protection systems in cooperation with alarm systems in the protection of buildings and vehicles.

### Course-related learning outcomes

Knowledge:

1. has knowledge in the field of modeling of electrical and power systems,
2. has an extensive knowledge of the construction and design of sensors, security and monitoring systems as well as complex microprocessor systems
3. has knowledge of designing systems of cooperation between alarm, monitoring and fire subsystems.

#### Skills:

1. is able to create models of basic systems and devices in electromobile systems,
2. knows how to use computer programs and IT technologies to design electronic systems in data exchange systems, gathering and presenting information in the field of electrical engineering
3. can apply and compare knowledge in the field of cooperation of property security systems with other installations.

#### Social competences:

1. developing the skills to study independently, work in a group and acquire new knowledge,
2. understanding the impact of IT technology on the work of an engineer, on the security of the power system and the environment.

### 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 60-90 minutes, consisting of 10-15 questions (open and close questions), 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.

Skills acquired as part of the project classes are verified on the basis of: grades from completed projects concerning security systems (including monitoring) and/or fire protection systems. In addition, the following are taken into account for the final evaluation of the laboratories: rewarding the knowledge necessary to implement the problems posed in a given area of project tasks, activity during 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 exercise task.

In addition, students can earn extra points for activity during classes, especially for: offering to discuss additional aspects of an issue, the effectiveness of applying the acquired knowledge when solving a given problem, the ability to cooperate within a team that practically performs a specific task in a laboratory, comments related to improving teaching materials, diligence and aesthetics of the developed tasks within self-study.

### Programme content

The module program covers issues related to the construction, principles of operation, use and principles of design and programming of alarm systems.

### Course topics

The lecture program includes the following issues:

History of electronic property security systems. Legal status. Designing alarm systems and property protection. Examples of implementation. Principles of designing an alarm system, fire protection system, property protection in a building or a vehicle. Using students' knowledge of other subjects, initiating discussions, asking questions to increase students' activity and independence. Classes at the university supplemented with materials enabling independent preparation for classes and broadening of knowledge. The latest system solutions (hardware and software) concerning the subject matter of the classes are used. Rules for preparing presentation of results of engineering calculations. Teaching support through extensive use of publicly available programs (open licenses), presentation of alternative sources allowing students to independently expand their knowledge and skills, learning to use individual skills in teamwork, encouraging students to design devices, transmission systems, developing experiments and programming on their own. The project class program covers the following topics:

1. Operation and programming of the Satel system with the Perfecta 16-WRL control panel
  2. Operation and programming of the Satel system with the INTEGRA 32 control panel
  3. Operation and programming of the Satel system with the Perfecta 16 control panel
- Design of alarm and property protection systems. Implementation examples. Classes at the university on real models of alarm systems, supplemented with materials enabling independent preparation

for classes and expanding knowledge. The latest system solutions (hardware and software) regarding the subject of classes are used.

### Teaching methods

Lectures: a multimedia presentation containing drawings, diagrams, photos, supplemented with practical examples on the blackboard, slides and computer programs, which makes it easier to link theory with practice. The lecture is supplemented with additional materials provided to students for independent study.

Project: The use of computer equipment with a multimedia projector and dedicated software. Individual and team work (design, selection, measurements, verification) using dedicated applications for the presentation and design of systems or subassemblies for data exchange and communication in vehicles and in production halls.

### Bibliography

Basic:

1. Krzyżanowski R., Układy mikroprocesorowe, Mikom, Warszawa 2004.
2. Nawrocki W., Komputerowe systemy pomiarowe, Wydawnictwa Komunikacji i Łączności, 2006.
3. Nawrocki W., Rozproszone systemy pomiarowe, Wydawnictwa Komunikacji i Łączności, 2006.
4. Technical documentation, data sheets.

Additional:

1. Nawrowski R., Skowronek K., Systemy alarmowe pojazdów samochodowych, Wydaw. Politechniki Poznańskiej, 1997.
2. Francuz T., Język C dla mikrokontrolerów, od podstaw do zaawansowanych aplikacji, Helion, Gliwice 2011.
3. Tatjewski P., Sterowanie zaawansowane obiektów przemysłowych. Struktury i algorytmy, Akademicka Oficyna Wydawnicza EXIT, Warszawa, 2002.
4. 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.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	80	3,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	50	2,00