

# Selected Control Systems - opis przedmiotu

Informacje ogólne	
Nazwa przedmiotu	Selected Control Systems
Kod przedmiotu	06.1-WM-ER-MiBM-02_18
Wydział	Wydział Nauk Inżynieryjno-Technicznych
Kierunek	WM - oferta ERASMUS
Profil	-
Rodzaj studiów	Program Erasmus
Semestr rozpoczęcia	semestr zimowy 2023/2024

Informacje o przedmiocie	
Semestr	1
Liczba punktów ECTS do zdobycia	5
Typ przedmiotu	obowiązkowy
Język nauczania	angielski
Sylabus opracował	• dr inż. Joanna Cyganiuk

Formy zajęć					
Forma zajęć	Liczba godzin w semestrze (stacjonarne)	Liczba godzin w tygodniu (stacjonarne)	Liczba godzin w semestrze (niestacjonarne)	Liczba godzin w tygodniu (niestacjonarne)	Forma zaliczenia
Wykład	30	2	-	-	Egzamin
Laboratorium	30	2	-	-	Zaliczenie na ocenę

## Cel przedmiotu

The aim of the course is to familiarize students with types of control systems, with control signals, and with the methods of implementation of control systems with the use of pneumatics, hydraulics, electronics and PLC controllers as well as with design and structure of control systems designed for actuators used in machines and appliances.

## Wymagania wstępne

Elements of Automation , The ability to use basic computer tools,

## Zakres tematyczny

The content of the lecture: Basic terms: operation, control, system, operation and disturbance quantities, system state. Linear and nonlinear systems, logic circuits, controllers. Electric control systems - electric drives. Pneumatic control systems. Electro-pneumatic control systems. Hydraulic control systems. Electro-hydraulic control systems. Pneumohydraulic control systems. Programmable logic controllers – structure, operation principle, application. Applications of control systems – practical examples. Design electric, pneumatic, hydraulic, electropneumatic, electro-hydraulic. Systems control – application of PLC controllers.

The content of the laboratory: Construction of logic control systems, function minimization – simulation of logic systems work. Construction and work simulation of virtual pneumatic and electro-pneumatic systems for given work conditions, testing their operation. Construction and work simulation of virtual hydraulic and electro-hydraulic systems for given work conditions. Construction and realization of real systems - work testing. Programming PLC controllers.

## Metody kształcenia

Lecturers are given with the use of multimedia technics. Work with specialist literature – textbooks, professional journals.

Laboratories are given with the use of computer software and laboratory stations– methods: problem tasks, solution analysis. Individual and group job during the realization of laboratory exercises.

## Efekty uczenia się i metody weryfikacji osiągnięcia efektów uczenia się

Opis efektu	Symbole efektów	Metody weryfikacji	Forma zajęć
The student has the necessary preparation to work in an industrial environment, and knows the safety rules associated with this work.		• wykonanie sprawozdań laboratoryjnych	• Laboratorium
The students can make a critical analysis of the way the self-designed control systems, know how and what equipment, appliances and components selected. He can suggest improvements and enhancements for the analyzed solutions.		• wykonanie sprawozdań laboratoryjnych	• Laboratorium
The student has structured and theoretically founded knowledge of the types and building control systems, including drive systems.		• egzamin - ustny, opisowy, testowy i inne	• Wykład

Opis efektu	Symbole efektów	Metody weryfikacji	Forma zajęć
The student is able to plan, build, modernize, and perform a computer simulation of control systems. Can design control systems for given work parameters.		<ul style="list-style-type: none"> <li>wykonanie sprawozdań laboratoryjnych</li> </ul>	<ul style="list-style-type: none"> <li>Laboratorium</li> </ul>
The student knows the basic techniques, appliances and methods used in building control systems.		<ul style="list-style-type: none"> <li>egzamin - ustny, opisowy, testowy i inne</li> </ul>	<ul style="list-style-type: none"> <li>Wykład</li> </ul>
The student can interact and work in a group as well as independently, he can work as a leader or as a member of a larger group.		<ul style="list-style-type: none"> <li>wykonanie sprawozdań laboratoryjnych</li> </ul>	<ul style="list-style-type: none"> <li>Laboratorium</li> </ul>

## Warunki zaliczenia

To get a credit the student has to pass all course forms.

## Literatura podstawowa

1. Nagrath I. J., Control Systems Engineering, New Age International Publishers, New Delhi 2017,
2. Reddy Y. J., Padma Raju K., Instrumentation and Control Systems, Mac Graw Hill Education, Columbus 2017,
3. Ebel F., Idler S., Prede G., Scholz D., Pneumatics, eectropneumatics -fundamentals, Bildungsverlag Eins, Germany 2010,
4. Hiraniya Singh K., Pneumatic and Hydraulic Systems, I K International Publishing House, New Delhi 2016,
5. Medhat K., Electro-Hydraulic Components and Systems: Hydraulic Systems Volume 2, Compudraulic LLC, USA 2017,
6. Erickson K., Programmable Logic Controllers: An Emphasis on Design and Application, Dogwood Valley Press, LLC, USA 2005.

## Literatura uzupełniająca

1. Wolovich W.A., Automatic control systems - basic, analysis and design, Saunders College Publishing, USA 1994,

## Uwagi

Lecture and Laboratory in English

Zmodyfikowane przez dr Katarzyna Skrzypek (ostatnia modyfikacja: 31-05-2023 14:15)

Wygenerowano automatycznie z systemu SylabUZ