

DESCRIPTION OF THE COURSE

- Course code: ELR2108
- Course title: DIGITAL CONTROL
- Language of the lecturer: Polish

<i>Course form</i>	<i>Lecture</i>	<i>Classes</i>	<i>Laboratory</i>	<i>Project</i>	<i>Seminar</i>
<i>Number of hours/week*</i>	<i>1</i>		<i>1</i>		
<i>Number of hours/semester*</i>	<i>15</i>		<i>15</i>		
<i>Form of the course completion</i>	<i>pass</i>		<i>pass</i>		
ECTS credits					
Total Student's Workload					

- Level of the course (basic/advanced): basic
- Prerequisites:
Completed courses: Fundamentals of Control Engineering 1, 2
- Name, first name and degree of the lecturer/supervisor:
Marek Michalik, Ph. D.
- Names, first names and degrees of the team's members:
Waldemar Rebizant, Ph. D., D. Sc.
Mirosław Łukowicz, Ph. D.
- Year: Semester:
- Type of the course (obligatory/optional): optional
- Aims of the course (effects of the course):
Learning of fundamental topics related to digital control algorithms design for different types of digital controllers.
- Form of the teaching (traditional/e-learning): traditional
- Course description:
Structure of digital control systems, A/C and D/C conversion, conditioning and digital filtering of input signals. Direct Digital Control: PID digital regulators, robust digital regulators, fuzzy control, state variable feedback compensation, digital control with state observers.
- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
<i>1. Structures of digital control systems, regular and non-regular plants, plant decomposition.</i>	<i>2</i>
<i>2. Input and output signal conditioning, analogue filtration. A/D and D/A conversion</i>	<i>2</i>
<i>3. Discrete representation of the continuous systems-methods, examples.</i>	<i>2</i>
<i>4. PID digital regulators – algorithms-examples.</i>	<i>2</i>
<i>5. Robust digital regulator design – basic methods.</i>	<i>2</i>
<i>6. . Digital state variable feedback control, examples</i>	<i>2</i>
<i>7. . Design of the digital state variable controllers, examples.</i>	<i>2</i>
<i>8. Control with digital state observers.</i>	<i>1</i>

- Classes – the contents:
- Seminars – the contents:
- Laboratory – the contents:
Analog and digital filtration of control system input signals- design of NOI and SOI filters, design of digital PID controllers and robust digital controllers, design of state variable feedback controllers (computer simulation), design of digital state observers, controllers using a state observer.
- Project – the contents:
- Basic literature:

[1] Kaczorek T., Teoria sterowania i systemów, WNT, Warszawa 1993.

[2] Niederliński A., Systemy cyfrowe automatyki przemysłowej, PWN, Warszawa 1977.

[3] Aufi R.: Digital Control Systems. Prentice Hall. 2004.

- Literatura uzupełniająca:

[1] Kuo B.J.: Digital Control Systems. Hold. Reinhard and Winston Inc. 1981

[2] Terano T., Asai K., Sugeno M., Applied Fuzzy Systems. AP Professional, 1994

Conditions of the course acceptance/creditation:

* - depending on a system of studies