DESCRIPTION OF THE COURSE

- Course code: ELR2168
- Course title: DIGITAL CONTROL
- Language of the lecturer: Polish

Course form	Lecture	Classes	Laboratory	Project	Seminar
Number of hours/week*	1		1		
Number of hours/semester*	11		11		
Form of the course completion	pass		pass		
ECTS credits	1		1		
Total Student's Workload	30		30		

- 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:

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

- 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/credition:

* - depending on a system of studies