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|---|------------------------------------|
| Title<br><b>(Elementy i urządzenia automatyki)</b>                                    | Code<br><b>1010331151010330982</b> |
| Field<br><b>Control Engineering and Robotics</b>                                      | Year / Semester<br><b>3 / 5</b>    |
| Specialty<br>-  | Course<br><b>core</b>              |
| Hours<br>Lectures: <b>2</b> Classes: -    Laboratory: <b>2</b> Projects / seminars: - | Number of credits<br><b>5</b>      |
|   | Language<br><b>polish</b>          |

**Lecturer:**

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**Status of the course in the study program:**

-Automation Devices and Components

**Assumptions and objectives of the course:**

-Presenting the actually produced devices and components for the industrial automation.  
The fundamental intent of lecturers is understanding of the operating principles of the devices and their programming modes.

**Contents of the course (course description):**

-Industrial processes as controlled plants. Classification of the automation devices. Conventional and network-based industrial control systems. Functional and technological automation diagrams. Static and dynamic characteristics of the devices. Controlling devices: analog and digital programmable controllers, industrial computers. Structure and algorithm of the PID controller. Hand- and autotuning of the PID controllers. Measuring devices: transducers and intelligent transformers. Devices for displacement, velocity, force, and moment, pressure, flow, temperature, humidity, turbidity, conductivity and pH measuring. Universal transformers with galvanic separation. The electric, pneumatic, and hydraulic actuators. Valve terminals. Network operating intelligent actuators. Gate, ball, butterfly, and diaphragma valves. Choice of the actuators and valves for the heating plants.

**Introductory courses and the required pre-knowledge:**

-The main physical laws, fundamentals of electronic and automatic.

**Courses form and teaching methods:**

-Computer aided lecturers: graphical presentations, films, simulations. Presentations some devices. Laboratory with various control systems containing automation devices.

**Form and terms of complete the course - requirements and assessment methods:**

-Written exam about operating principles of the various devices. Checking of the knowledge about actual offer in area automation devices.

**Basic Bibliography:**

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**Additional Bibliography:**

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