| Title **Neural and Fuzzy Controllers** | Code **1010335121010330248** |
|---|---|
| Field **Automatic Control and Robotics** | Year / Semester **1 / 2** |
| Specialty **-** | Course **core** |
| Hours Lectures: **2**  Classes: **-**  Laboratory: **2**  Projects / seminars: **-** | Number of credits **6** |
| | Language **polish** |

**Lecturer:**

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

Obligatory.

**Assumptions and objectives of the course:**

The student should obtain knowledge about artificial intelligence methods and their application in control.

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

Biological foundations of cybernetics. Methods of ?computational intelligence? (artificial intelligence). Biological neural networks. Models of perceptron and neurone. Artificial neural networks (ANN). Area of neural networks applications. ANN realisation. Examples of ANN applications in control systems. Identification of friction model. Control of squirrel cage motor. MATLA Neural Toolbox. Basic definitions in theory of Fuzzy Sets and Fuzzy logic. Process of fuzzyfication, defuzzyfictation and fuzzy reasoning. Fuzzy logic application to modelling of non-linear systems. Fuzzy controller. Fuzzy sliding-mode controller. TSK controller. Examples of fuzzy logic applications in control systems. Robust fuzzy PI controller. MATLAB Fuzzy Toolbox. Neuro-fuzzy systems.

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

Basic knowledge of control theory.

**Courses form and teaching methods:**

Lectures supported by transparencies and simulation on laboratory classes.

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

Lecture: exam; laboratory exercises: reports.

**Basic Bibliography:**

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**Additional Bibliography:**

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