**Intelligent Control Systems (ECTS credits: 6)**

Language: the course is offered in English, Serbian and Hungarian.

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**Course description:**

The course covers soft computing fundamentals with emphasis on fuzzy logic and fuzzy logic controller. The themes are as follows: Fundamentals of control systems, PID, fuzzy logic operators, Mamdani inference system, Sugeno inference system, usage of fuzzy logic in control systems, PID fuzzy, artificial neural network, back propagation algorithm, hybrid systems, genetic algorithms, ANFIS for control systems.

**This course covers the following topics**

1. Introduction
2. PID
3. Blackbox, whitebix modeling
4. Fuzzy logic
5. Fuzzy operators , membership functions
6. Fuzzy controler Mamdani FIS
7. Defuzzyfication, Sugeno FIS
8. Larsen Tsukamoto FIS
9. PID fuzzy
10. Artificial neuron
11. Neural networks, backpropagation algorithm
12. Neural control
13. Genetic algorithms
14. Hybrid control systems
15. Closing remarks

**Aims:**

* to help students to gain knowledge about soft computing
* to develop practical knowledge about system modeling
* to use intelligent control methods in technical systems

**Learning outcomes:**

After completing the course the student should be able to:

* use fuzzy logic to create fuzzy inference system
* implement fuzzy inference system in control
* implement adaptive neuro fuzzy inference systems