Course Unit Descriptor

Study Programme: Computing And Control Engineering
Course Unit Title: Optimal, nonlinear and advanced control
Course Unit Code: AU509
Name of Lecturer(s): Kapetina Mirna, Rapaić Milan, Jeličić Zoran
Type and Level of Studies: master
Course Status (compulsory/elective): elective
Semester (winter/ summer): winter
Language of instruction: english
Mode of course unit delivery (face-to-face/distance learning): face-to-face
Number of ECTS Allocated: 6
Prerequisites: none
Course Aims:. Students gain theoretical and practical knowledge about optimal, nonlinear and other advanced control systems and algorithms
Learning Outcomes: The acquired knowledge is used in solving practical engineering problems, but it can also serve as basis for further professional and scientific development.
Syllabus. 1. Introduction to advanced control systems 2. Phase diagrams. Characteristic nonlinearities of physical systems 3. Stability of nonlinear systems. Lyapunov direct method 4. Linearization (at equilibrium and by feedback) 5. State regulators - pole placement 6. Introduction to optimal control - Maximum principle 7. Introduction to dznamic programming 8. Linear optimal regulators - LQR 9. Variable structure control and sliding modes 10. State and disturbance estimation 11. Introduction to adaptive control systems 12. Estimation of process parameters 13. Indirect adaptive control 14. Direct adaptive control
Required Reading: Relevant literature in English, tbd

Weekly Contact Hours: 2	**Lectures: 3**	**Practical work: 0**

Teaching Methods: Lectures. Computer and Laboratory exercises. Projects. Consultations.
Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Attendance			
Computer exercises			
Tests (4x)			