

		Course title: Adaptive discrete systems and neural network		
Course code	Course status	Semester	Number of ECTS credits	Lecture hours
PA2104	Mandatory	I	6	3+1

Study program: Graduate academic studies, ELECTRICAL ENGINEERING, study program: Electronics, Telecommunications and Computer engineering (studies last for 4 semesters, 120 ECTS credits).	
Prerequisites: No prerequisites required.	
Course aims: Students will be introduced in implementation issues and advantages of adaptive discrete systems and neural networks. During this course students will obtain basic theoretical knowledge and will be able to solve practical problems.	
Teacher(s) and assistant(s) first and last names: Ph.D. Ljubiša Stanković – teacher Ph.D. Miloš Daković – teacher	
Studying method: Lectures, exercises, laboratory exercises, individual work on practical tasks, consultations.	
Course synopsis:	
Preliminary week	Preparation and semester enrolment.
I week	Introduction, basic concepts and applications of adaptive systems and neural networks
II week	Adaptive linear adder
III week	Eigen values and eigen vectors, geometrical interpretation
IV week	The error signal and its minimization, Orthogonality principle
V week	Least slope method
VI week	First test- project work
VII week	Free week
VIII week	LMS (least mean square) algorithm
IX week	Modification of LMS algorithm
X week	LMS algorithm implementation
XI week	RLS (Recursive least square) algorithm
XII week	Complex LMS and RLS algorithm
XIII week	Second test- project work
XIV week	Neural networks, definition and examples
XV week	Neural networks, error-backpropagation algorithm for training neural networks
XVI week	Final exam
Final week	Administrative procedures.
XVIII-XXI week	Additional lessons, correction of the final exam and administrative procedures.
STUDENT WORKLOAD	
<u>per week</u>	<u>per semester</u>
Working hours: 6 credits x 40/30 = 8 hours.	Teaching and the final exam: (8hours) x 16 = 128hours.
Working hours structure:	Necessary preparation (before semester): 2 x (8hours) = 16hours.
3 hours for teaching	Total work hours for the course: 176hours
1 hour for exercises	Additional hours for preparing correction of the final exam, including the exam taking: up to 32hours.
4 hours for individual work, including consultations.	Work hours structure:
	128hours (lectures) + 16hours (preparation) + 32hours (additional work)
Lessons attendance is mandatory for students, as well as doing home and laboratory exercises and both tests.	
Literature Lj. Stanković, M. Daković: Adaptive discrete systems and neural networks, script	
The forms of knowledge testing and grading: 60 points during the course (homeworks, colloquiums, projects) 40 point - final exam	
Special remarks for the course : If needed, the course can also be taught in English.	
Teacher(s) who provided the information: Ph.D. Ljubiša Stanković	