Course Unit Descriptor

Study Programme: Mechanical Engineering			
Course Unit Title: Intelligent Machining Processes			
Course Unit Code: 21.DAS102			
Name of Lecturer(s): Assistant professor Mića Đurđev, PhD			
Type and Level of Studies: Master Academic Degree			
Course Status (compulsory/elective): Elective			
Semester (winter/summer): Summer			
Language of instruction: English			
Mode of course unit delivery (face-to-face/distance learning): Face-to-Face			
Number of ECTS Allocated: 5			
Prerequisites: None			
Course Aims: Introduction to algorithms and techniques in the field of machine intelligence. Developing intellectual abilities, skills, and habits for using machine intelligence systems in machining processes.			
Learning Outcomes: Students acquire knowledge and skills for working in the field of theory and applications of machine intelligence and machine learning. They are capable of applying their acquired knowledge to clearly define problems and their solutions using existing software tools. They are equipped to apply existing algorithms and implement systems of machine intelligence and machine learning.			
Syllabus: *Theory* The concept of machine intelligence. A brief historical overview. Development trends. The role of knowledge in task solving. State space and state space search. First-order predicate calculus. Resolution rule. Theory of fuzzy sets. Imprecision, graduality, subjectivity. Relationship to classical logic and probability. Operations on fuzzy sets. Linguistic (fuzzy) variables. Linguistic modifiers. Fuzzy numbers. Logical measures (norms and conorms). Fuzzy relations. Fuzzy logic, fuzzy reasoning methods. Fuzzy control. Development of fuzzy controllers. Examples of fuzzy logic applications in databases, decision making, engineering, and medicine. Neural networks - models of natural and artificial neurons. Types of artificial neural networks (ANNs). Training ANNs. Examples of applications. Other systems of machine intelligence *Practice* Completion of assigned examples and tasks. Using MATLAB (Octave - Forge) environment. Implementations in high-level programming languages. Application of theoretical knowledge to specific practical problems.			
Required Reading: None			
Weekly Contact Hours: 4	**Lectures:** 2	**Practical work:** 2	
Teaching Methods: Verbal and textual, illustrative and demonstrative, laboratory and experimental. Presentations, dialogue, discussion, graphical presentations, tasks, software demonstrations, computer experiments, software development.			
Knowledge Assessment (maximum of 100 points):			
Pre-exam obligations	points	**Final exam**	points
Active class participation	10	written exam	/

Practical work	10	oral exam	50
Preliminary exam(s)	30	…….	
Seminar(s)	/		
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			