

<b>Course title:</b> Machine learning (code ID017)		
<b>Lecturer(s):</b> Miloš M. Radovanović, Vladimir M. Kurbalija		
<b>Status:</b> elective		
<b>ECTS:</b> 7		
<b>Requirements:</b> none		
<b>Learning objectives</b> Enabling students to master the principles of functioning of machine learning techniques, as well as their implementation and application to real-world problems.		
<b>Learning outcome</b> <i>Minimal:</i> At the end of the course it is expected from a successful student to demonstrate basic understanding of the principles of machine learning techniques, and capability to apply the techniques on an illustrative example. <i>Desirable:</i> At the end of the course it is expected from a successful student to demonstrate thorough understanding of the principles of machine learning techniques through critical analysis, selection, implementation, and application of the techniques to real-world problems, as well as to employ research methods in machine learning		
<b>Syllabus</b> <i>Theory</i> Notions of machine learning and data mining. Intelligent agents, the action-perception cycle, applications. Supervised, semi-supervised and unsupervised learning. Classification: techniques, performance measures, overfitting. Dimensionality reduction, feature selection. Clustering: techniques, performance measures. Reinforcement learning. Numeric prediction, regression, neural networks. Association learning. Data transformation and preparation. Applications of machine learning techniques. <i>Practice</i> ---		
<b>Recommended literature</b> 1. I. H. Witten, E. Frank, M. A. Hall. <i>Data Mining: Practical Machine Learning Tools and Techniques</i> . Morgan Kaufmann Publishers, 2011		
<b>Weekly teaching load</b>	Lectures: 3	Student research: 0
<b>Teaching methodology</b> Lectures are held using classical methods involving a projector. Principles of functioning of machine learning techniques are explained, and the explanations are augmented with illustrative examples. Implementations of machine learning techniques are presented and tested on the computer. Students' knowledge is checked through a written test, solution of problems, and preparation of a seminar paper that is defended at the end of the course, where they independently explore various research topics in machine learning.		
<b>Grading method (maximal number of points 100)</b> Test 20, problems 30. Final exam - Seminar paper 50.		