ECTS catalog with learning outcomes
University of Montenegro

Faculty of Science and Mathematics / COMPUTER SCIENCE / ARTIFICAL INTELLIGENCE

Course:	ARTIFICAL INTELLIGENCE			
Course ID	**Course status**	**Semester**	**ECTS credits**	**Lessons** (Lessons+Exercises+Laboratory)
1342	Mandatory	5	5	3+2+0
Programs	COMPUTER SCIENCE			
Prerequisites	None.			
Aims	An overview of AI, including search, knowledge representation, probabilistic reasoning and decision making under uncertainty, and machine learning. Illustrate the ways in which AI techniques can be used to solve real-world problems.			
Learning outcomes	At the end of the course, the participant is expected to be able to: 1. Describe the role og propositional logic and first order logic in logic programming [Usage] 2. Implements simple Prolog and Lisp programs and explain how complex programs work [Usage] 3. Formulate an efficient problem space for a problem expressed in natural language and formulate a problem as a search problem [Usage] 4. Compare and contrast the basic techniques for representing uncertainty and inference algorithms [Assessment] 5. Identify the similarities and differences among various machine learning algorithms [Usage] 6. Integrate the artificial intelligence techniques in the software [Usage]			
Lecturer / Teaching assistant	Goran Šuković, Savo Tomović			
Methodology	The course is face-to-face, five 45-minutes sessions per week (3 lecture sessions and 2 lab session). The primary format is lecture but there are many active learning and problem solving activities integrated into the lecture sessions			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Introduction. History. Uninformed search.			
I week exercises	Intro to Lisp programming.			
II week lectures	Informed Search.			
II week exercises	Lisp functions and macros.			
III week lectures	Local search.			
III week exercises	Data structures in LISP.			
IV week lectures	Adversarial search.			
IV week exercises	Data structures in LISP.			
V week lectures	Constraint Satisfaction Problems			
V week exercises	Knowledge representation. Intro to FOL.			
VI week lectures	Constraint Satisfaction Problems			
VI week exercises	Resolution. Inference. Unification. Forward and Backward chaining.			
VII week lectures	Midterm (pen and pencil part)			
VII week exercises	Midterm (programming part)			
VIII week lectures	Uncertainty.			
VIII week exercises	Prolog intro.			
IX week lectures	Reasoning under uncertainty.			
IX week exercises	Search algorithms in Prolog.			
X week lectures	Bayes nets.			
X week exercises	Advanced algorithms and data structures in Prolog.			
XI week lectures	Introduction to Machine Learning. Overfiiting.			
XI week exercises	Probability. Bayes rule.			
XII week lectures	Decision trees, K-NN, Naive Bayes.			
XII week exercises	Bayes net examples. Exact and approximate inference.			

XIII week lectures	Neural Networks.
XIII week exercises	WEKA.
XIV week lectures	Support Vector Machines. Boosting.
XIV week exercises	WEKA.
XV week lectures	
XV week exercises	
Student workload	Weekly: 5x40/30 = 6 hours 20 minutes Lectures: 2 hours 15 minutes Labs: 1 hour 30 minutes Other: 0 Individual work: 2 hours 35 minutes

Per week	**Per semester**
5 credits x 40/30=6 hours and 40 minuts 3 sat(a) theoretical classes 0 sat(a) practical classes 2 excercises **1 hour(s) i 40 minuts** of independent work, including consultations	Classes and final exam: **6 hour(s) i 40 minuts x 16 =106 hour(s) i 40 minuts** Necessary preparation before the beginning of the semester (administration, registration, certification): **6 hour(s) i 40 minuts x 2 =13 hour(s) i 20 minuts** Total workload for the subject: **5 x 30=150 hour(s)** Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) **30 hour(s) i 0 minuts** Workload structure: **106 hour(s) i 40 minuts (cources), 13 hour(s) i 20 minuts (preparation), 30 hour(s) i 0 minuts (additional work)**
Student obligations	
Consultations	Room 128
Literature	Russel, Norvig – Artificial Intelligence Modern Approach (3rd edition), Prentice Hall, 2010. Lecture slides (PDF and PPT)
Examination methods	- Essay 5% - Homeworks (6 homeworks, 4-6% each) = 25% - Midterm 35% - Final 35%
Special remarks	The lecturer is able to offer course in English and Russian.
Comment	www.pmf.ac.me, ai@rc.pmf.ac.me

Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points