

General Information			
Course name ÚINF/VYZ1/15	Computational Complexity	ECTS Credits	4
		Semester	1
Aims			
To give students background in the computational complexity and theory of NP-completeness			
Content			
<p>Deterministic and nondeterministic algorithms with polynomial time; NP-completeness. Deterministic simulation of a nondeterministic Turing machine. Satisfiability of Boolean formulae. Other NP-complete problems: satisfiability of a formula in a conjunctive normal form, 3-satisfiability, 3-colorability of a graph, 3-colorability of a planar graph, knapsack problem, balancing, etc. Space bounded computations, classes LOG-space and P-space. Deterministic simulation: Savitch's theorem. Closure under complement. Classification of computational complexity of problems.</p>			
Assessment Methods and Criteria			
<p>1. Attendance - students are expected to attend each class according to the schedule. Should the student miss three or more classes, he/she will not receive credits for the course no matter what his/her overall results are on the tests(s). The student must be on time for class.</p> <p>2. Active participation - students are required to do their best with respect to active participation in seminar sessions. Students are expected to bring their own copies of the required materials and complete the assigned tasks and exercises.</p> <p>3. Assessment – students will take 2 written tests. There will not be any re-take tests for the students who failed in one or both credit tests.</p> <p>Final assessment – scores of both tests will be summed up and it must be minimum 51%, which is a pass mark for the course. Otherwise, the students will not receive credits for the course. The final grade for the course will be based on the grading scale.</p>			
<p>Grading Scale (in %):</p> <p>A 91-100%</p> <p>B 81-90%</p> <p>C 71-80%</p> <p>D 61-70%</p> <p>E 51-60%</p> <p>FX 50 and less</p>			
<p>Grading System:</p> <p>The University recognizes the following six degrees for the evaluation of the study results:</p> <p>a) A – excellent (excellent results) (numerical value 1)</p> <p>b) B – very good (above average results) (1.5)</p> <p>c) C – good (average results) (2)</p> <p>d) D – satisfactory (acceptable results) (2.5)</p> <p>e) E – sufficient (results meet the minimum criteria) (3)</p> <p>f) FX – failed (requires further work) (4)</p>			
Bibliography			

AHO, A. V. and ULLMAN, J.D.: The design and analysis of computer algorithms. Addison-Wesley, 1974

van EMDE BOAS, P.: Machine models and simulations. In J.van Leeuwen (ed.): Handbook of theoretical computer science. North-Holland, 1990

YAP, Ch.K.: Introduction to the theory of complexity classes. To be published by Oxford Univ. Press. (Electronic version available via anonymous <ftp://cs.nyu.edu/pub/local/yap/complexity-bk>).

