

<b>Óbuda University</b>		Alba Regia Technical Faculty Institute of Engineering	
<b>Subject name and code: FORMAL LANGUAGES, NKHA1SSNC</b>		<b>Credit: 2</b>	
<i>Full time course</i>		2014/15 Academic Year Semester 2.	
Training Programs running this course: Engineering Informatics BSc			
Subject leader:		Teachers: Horváth Árpád	
Prerequisites:		-	
Weekly lectures: 2	Practices: 0		
Measuring points:		midterm mark based on lecture tests and midterm tests	
<b>A tananyag</b>			
Learning objectives: <i>The aim of the course is to introduce the formal languages and abstract automata. Some applications are included.</i>			
<b>Topics</b>			<b>Hours</b>
1. Formal languages, grammars, abstract automata: basic concepts of languages. Chomsky hierarchy of grammars and languages			2
2. Deterministic and nondeterministic final automaton. NFA to DFA conversion.			2
3. Relationship between regular grammars and (deterministic) final automaton. Conversion into each other.			2
4. <b>Full finite automaton. Minimal automaton. Exercises.</b>			2
5. <b>1. test.</b> Operations on languages			2
6. Regular expressions in theory and its application.			2
7. Derivation tree of context-free grammars. Ambiguous and unambiguous grammars/languages.			2
8. Transformation of context free grammars into proper grammar: unnecessary production rules, epsilon-rules, cycle. Recursion.			2
9. Normal forms of context-free grammars: Chomsky NF, Greibach NF. Left recursion. Exercises about CFGs.			2
10. Concept of pushdown automaton, state diagram of PDAs, its types (accepts with empty stack/ final state).			2
11. Solving exercises.			2
12. <b>2. test.</b> Translator automata			2
13. Summary			2
<b>Measuring and Grading</b>			
There will be two tests with 20-20 scores each of them.			
Requirements of Teacher's Signature	Average result of weekly tests at least 50%.		
Grading : 0-50 %      fail -63%        pass, -75 %        satisfactory -82%        good above        excellent			
where average result of weekly tests gives 50% result of exam gives 50%			

<b>Literature:</b>	
Compulsory:	<ul style="list-style-type: none"><li>• Keijo Ruohonen: Formal languages, 2009.</li><li>• A <a href="http://elearning.uni-obuda.hu">http://elearning.uni-obuda.hu</a> oldalon található segédletek</li></ul>
Recommended:	<ul style="list-style-type: none"><li>• <i>The Emperor's New Mind: Concerning Computers, Minds, and The Laws of Physics</i> (1989, ISBN 0-14-014534-6 (paperback); mainly the part dealing with Turing machines</li></ul>

Dr. Horváth Árpád  
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