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| 1. Course title: Formal Languages and Automata | | | | | |
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| 2. Code: | | 3. Type (lecture, practice etc.): seminar | | | |
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| 4. Contact hours: 4 hoursper week | | 5. Number of credits (ECTS): 7 | | | |
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| 6. Preliminary conditions (max. 3): - | | | | | |
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| 7. Announced:fall semester, spring semester, both | | | | | |
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| 8. Limit for participants: - | | | | | |
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| 10. Responsible teacher (faculty, institute and department):  Prof. Dr. Sándor Jenei (Faculty of Science, Institute of Mathematics and Informatics, Department of Informatics) | | | | | |
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| 11. Teacher(s) and percentage: | | Prof. Dr. Sándor Jenei | | 100 % | |
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| 12. Language:English | | | | | |
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| 13. Course objectives and/or learning outcomes:  Objectives: The lecture intends to introduce students to the basics of formal languages and automata theory including the basic definitions, results, and methodology.  Learning outcomes: students completing the course will have *knowledge* on the basic notions and results of the theory of formal languages and automata, along with the related specific terminology. They will be *able* to solve problems related to generative grammars and finite state machines. | | | | | |
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| 14. Course outline   1. Alphabets, words, formal languages, operations on formal languages and their properties 2. Generative grammars 3. The Chomsky hierarchy 4. Regular languages (union, product, iteration, finite languages) 5. Bar-Hillel lemma for regular languages and its consequences 6. Deterministic Finite State Machines (FSM) 7. Nondeterministic FSMs 8. The equivalence of Deterministic and Nondeterministic Finite State Machines 9. Connection of FSMs and regular languages 10. Regularity of the complement and intersection of regular languages 11. Minimization of FSMs 12. Context independent languages, derivation trees 13. Bar-Hillel lemma for context independent languages and its consequences   Every week exercises will be done in relation with the material of the week. | | | | | |
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| 15. Mid-semester works  Attending seminars is obligatory. Exercises, related to the topic of the week will be solved every week along with regular homework. There will be written exams in week 6, 12, and 13. | | | | | |
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| 16. Course requirements and grading  The final mark is an average of the three written exams. | | | | | |
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| 17. List of readings   1. Peter Linz, An introduction to Formal Languages and Automata (Fifth Edition), University of California at Davis, Jones & Bartlett Laerning (<http://eng.uok.ac.ir/daneshfar/IntroductionToFormalLanguages/Peter%20LinzBook%205ed/An%20Introduction%20to%20Formal%20Languages%20and%20Automata%20-%205th%20Edition%20-%202011.pdf)> | | | | | |
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| 18. Recommended texts, further readings   1. Selected exercises from the web sent on a weekly basis via email. 2. D. Goswami and K. V. Krishna, Formal Languages and Automata Theory (<https://www.iitg.ernet.in/dgoswami/Flat-Notes.pdf>) 3. Explantory material on <http://www.ics.uci.edu/~goodrich/teach/cs162/notes/> | | | | | |
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| **Date** | 19 April, 2017 | **Prepared by** |  | | |
| Prof. Dr. Sándor JENEI  responsible teacher | | |
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| **Endorsed by** | | |  | | |
| program supervisor | | |