

CS 302 Automata Theory

Spring 2021

	<i>NAME/SCHEDULE</i>	<i>E-MAIL/PLACE</i>	<i>OFFICE HOUR</i>
<i>INSTRUCTOR</i>	<i>Kemal İNAN</i>	<i>inan</i>	<i>By appointment</i>
<i>ASSISTANT(S)</i>	<i>Cavit Özbay (TA)</i> <i>Arda Şener (TA)</i> <i>Müge Kuşkon (LA)</i> <i>Berk Türetken (LA)</i>	<i>cavitozbay</i> <i>ardasener</i> <i>mugekuskon</i> <i>berkturetken</i>	<i>W 13:40 - 14:30</i> <i>M 11:40 - 12:30</i> <i>R 12:40 - 13:30</i> <i>M 16:40 - 17:30</i>
<i>LECTURES</i>	<i>W 12:40 – 13:30</i> <i>Th 10:40 – 12:30</i>	<i>REMOTE</i>	
<i>RECITATION</i>	<i>Th 14:40 – 16:30</i>	<i>REMOTE</i>	

Main Text: [*Introduction to Automata Theory, Languages and Computation*](#) , Hopcroft, Motwani & Ullman, Pearson (Addison Wesley) 2006 , 3rd edition

Auxiliary Text : *Elements of the Theory of Computation*, Lewis & Papadimitriou, Prentice Hall 1998.

Grading Policy: 10% HW, 35% Quizzes, 20% MT, 35% Final

Important: 10 quizzes with 20 minute duration each shall be part of the course. Quizzes will be held during chosen lectures. A student missing more than 3 quizzes **fails** irrespective of **medical or any other excuses!** The overall quiz grading will be the average of the best 7 out of 10.

Homework Policy: There will be 8 homeworks as part of the course. HW collection policy shall be announced in time.

Tentative Schedule

<i>Feb. March</i>	24 1	25 2	3 3	4 3 HW1	10 4	11 4,5 HW2	17 5	18 6 HW3	24 7	25 7
<i>March April</i>	31 8	1 8 HW4	7 9	8 9	14 10	15 10,11 HW5	21 12	22 12	28 Midterm	29 13 HW6
<i>May</i>	5 14,15	6 15 HW7	12 Holiday	13 Holiday	19 Holiday	20 16	26 17	27 17 HW8		
<i>June</i>					xx Final					

Tentative Course Outline

- 1 – Introduction: Languages, Automata and Grammars (Main Text (MT) 1.1, 1.5) Slide1*
- 2 – Deterministic Finite Automata as Language Acceptors (DFA) (MT 2.1, 2.2) S2*
- 3 – Nondeterministic Finite Automata (NFA) and Linguistic Equivalence to DFA (MT 2.3 - 2.5) S2*
- 4 – Regular Expressions (RE) (MT 3.1) S3*
- 5 – RE and NFA (M.T 3.2) S3*
- 6 – Regular Languages and Properties (M.T. 4.1, 4.2) S3-S4*
- 7 – Algorithms for the DFA and NFA (MT 4.3, 4.4) S4*
- 8 – State Equivalence and Minimal State DFA (MT 4.4) S4*
- 9 – Context-Free Grammars (CFG) (MT 5.1) S5*
- 10– Parse Trees and Applications (MT 5.2, 5.3) S5*
- 11 – Ambiguity in Grammars and Languages (M.T. 5.4) S5*
- 12 – Pushdown Automata (PDA) (MT 6.1, 6.2) S6*
- 13 – CFG and PDA (M.T. 6.3) S6*
- 14 – Deterministic Context-Free Languages (MT 6.4) S6-S7*
- 15 – Properties of and Algorithms for Context Free Languages (MT 7.1,7.2, 7.4) S7*
- 16 - Determinism and Parsing (AT 3.7, p 158-177) S7*
- 17 - Introduction to Turing Machines (AT Chapters 4 ,5 selections) S8*