

CS 302 - Formal Languages & Automata Theory Fall 2022

	<i>NAME / SCHEDULE</i>	<i>E-MAIL / PLACE</i>	<i>OFFICE HOUR</i>
INSTRUCTOR	<i>Kemal İNAN</i>	<i>inan</i>	<i>By appointment</i>
ASSISTANTS	<i>Müge KUŞKON</i>	<i>mugekuskon FENS 2014</i>	<i>Mon. 8:40-9:40</i>
	<i>Ali Kağan AKBAŞ</i>	<i>akagan Id: 560 349 2647 Password: 06J4cq</i>	<i>Fri. 12:40-14:30</i>
	<i>Işıktan TANIŞ</i>	<i>isiktantanis https://sabanciuniv.zoom.us/j/4787354805?pwd=VG9jS082TkE1QVFjK3RoZ3BoSUM4Zz09</i>	<i>Mon. 12:40-14:30</i>
LECTURES	<i>Tu 12:40 – 14:30 live W 15:40 – 16:30 remote</i>	<i>FENS G032 https://sabanciuniv.zoom.us/j/779384517</i>	
RECITATION	<i>Tu 14:40 – 15:30 live</i>	<i>FENS G032</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 15 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 excuse! The overall quiz grading will be the average of the best 7 out of 10.

A quiz may take place in any 15 minute interval during a live lecture.

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

Tentative Schedule (green dates = 2 hour live lectures)

October /November	4 1,2	5 2	11 3 HW1 due 18	12 3	18 4,5 HW2 due 1	19 5	25 6	26 6	1 7 HW3 due 15	2 7
November	8 7,8	9 8	15 8+ Midterm HW4 due 22	16 9	22 10,11 HW5 due 29	23 12	29 12,13 HW6 due 13	30 13		
December	6 14,15	7 15	13 16 HW7 due 27	14 16	20 17	21 17	27 17 HW8 due final rec.	28 17		
January	3 17	4 17						<i>Final Exam :</i> <i>Jan 19th</i> <i>Thursday at</i> <i>16:00</i> <i>in FMAN</i> <i>1099</i>		

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 – State Equivalence and Minimal State DFA (MT 4.4) S4*
- 8 – Algorithms for the DFA and NFA (MT 4.3, 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*