		CMPE471 Auto	omata The	ory			
Department:	Computer E	ngineering		•			
<b>Instructor Inf</b>							
	Prof. Dr. Muhami						
	nmed.salamah@er	nu.edu.tr					
Office: CMPE Office Tel: 114							
Assistant Info							
Name: Felix							
	Office: CMPE 119						
Office Tel: 12							
Meeting times		DE 1 <b>27</b>					
	-10:20, Room CM 6:20, Room CMP						
	0-10:20, Room CM						
•	e: Computer En	· · · · · ·	Prog	gram Code: 25			
Course Numb		Credits:	6	Year/Semester:			
CMPE471		4 Cr		2021-2022 Fall			
Required C	Course 🗌 Ele	ective Course (click on	and check the a	ppropriate box)			
Prerequisite(s		×					
	crete Mathematics						
Catalog Descr	1	1 D (	••				
				n-deterministic finite automata. Regular nmars. Context-free languages. Pushdown			
				and recursively enumerable sets. Turing			
machines. Con		fullengt entrestationed grann		and recursively chameracte sets. Faring			
Course Web F	age:						
http://cmpe.em		npe471					
	u.edu.tr/courses/cr	npe471					
Textbook(s):	u.edu.tr/courses/cr		Automata Theor	ry, Languages, and Computation", 2nd or			
<b>Textbook(s):</b> J.E. Hopcroft, above editions,	u.edu.tr/courses/cr R. Motwani, J.D. Addison-Wesley.		Automata Theor	ry, Languages, and Computation", 2nd or			
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## Tutorial Schedule:

- (2 hours of tutorial per week)
- Week 3 Solving questions on Mathematical Principles, Strings and Alphabets, Formal Languages, The notion of Grammar.
- Week 4 Solving questions on Context-Free Grammars (CFG).
- Week 5 Solving questions on FA.
- Week 6 Solving questions on NFA and DFA.
- Week 7 Solving questions on Regular Expressions.
- Week 10 Solving questions on Equivalence of FA and Regular Languages.
- Week 11 Solving questions on Context Free Languages (CFL).
- Week 12 Solving questions on Chomsky and Greibach Normal Forms.
- Week 13 Solving questions on PDA.

## **Course Learning Outcomes:**

Upon successful completion of the course, students are expected to have the following competencies:

- (1) Design a finite automaton (FA) for a specified language (1,2)
- (2) Design a push-down automaton (PDA) for a specified language (1,2)
- (3) Convert non-deterministic automata to deterministic automata (2)
- (4) Use regular expressions for specifying languages (1)
- (5) Convert between regular expressions and finite automata (2)
- (6) Minimize finite automata (2)
- (7) Design/Use context free grammars (1,2)
- (8) Put a context-free grammar into various normal forms (2)
- (9) Formally describe languages generated by grammars (1)
- (10) Formally describe languages accepted by finite automata (1)
- (11) Formally describe languages accepted by PDA (1)

(12) Convert between context free grammars and PDA (1)				
	Method	No	Percentage	
	Midterm Exam	1	40 %	
Assessment	Assignments	4	5 %	
	Tutorials		5%	
	Final Examination	1	50 %	

**Policy on makeups:** Only one makeup exam can be given for one of the missed exams (Midterm or Final) according to the University regulations.

Policy on Tutorials and Grading: Online Attendance is mandatory.

NG grade will be given if the student missed all Assignments and both Midterm Exam and Final Exam.

## **Contribution of Course to Criterion 5**

Credit Hours for: Mathematics & Basic Science : 0 Engineering Sciences and Design : 4 General Education : 0

## **Relationship of the course to Program Outcomes**

The course has been designed to contribute to the following program outcomes:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

Prepared by: Assoc.Prof.Dr. Muhammed Salamah	Date Prepared: October, 2021