Course title	Code	semester	T+U	credit	ECTS
Formal Languages and Automata Theory		4	3+0	3	6

Prerequisite Courses	
Language of the Course	English
Type of Course	Compulsory
Course Level	Undergraduate
Course Coordinator	
Instructors	
Course Assistants	
The aim of lesson	To provide students with knowledge about Automata Theory and Formal Languages theory and computational models. In this way, it is aimed that students learn alternative calculation methods and use the alternatives of today's computer technology by thinking multi-dimensionally.
Course Learning Outcomes	**At the end of this course, the student;** 1-Defines the calculation models. 2-Applies alternative computational models to produce solutions to problems. 3-Lists the strengths and weaknesses of the computational models. 4-Defines complexity classes.
Course Content	Mathematical background, Finite automata: DFA, NFA, DFA = NFA, Regular expressions: regular languages, Regular grammars, Closeness, Pigeonhole principle, Pumping lemma , Context Free Languages: Parsing and Ambiguity, Parse Trees Trees , Heap Automata, Pumping for Context Free Languages lemma , Turing Machine: How does it calculate?, Types of Turing Machines, Curch - Turing Thesis, Termination Problem, Unsolvable Problems, Computational Complexity: P-set, NP-set, Cook 's Theorem

Weeks	Topics
one	Mathematical Background
2	Finite Automata: DFA, NFA, DFA = NFA, How to Implement ?
3	Finite Automata
4	Regular Languages, Regular Grammars, Closeness, Pigeonhole Principle, Pumping lemma ,
5	Regular Expressions
6	Context Free Languages: Parsing and Ambiguity, Parse Trees, Stack Automata
7	Pumping for Context-Free Languages lemma _
8	Context Free Languages
9	Context Free Languages
10	Turing Machine: How Does It Calculate? Turing Machine Types
11th	Curch -Turing Thesis
12	Computational Complexity: P-Set, NP-Set, Cook's Theorem
13	Termination Problem, Unsolvable Problems
14	Termination Problem, Unsolvable Problems
15	An overview

General Competencies

Comprehending finite automata and computation theory and using them in field applications.

resources

Lewis, H.R. & Papadimitriou, C.H., (1998). *Elements of the Theory of Computation,* Prentice Hall.
Sipser, M., (2006). *Introduction to Theory of Computation* Thomson, Course Technology

Değerlendirme Sistemi

The dates, days and hours of the Midterm Exam, Quiz, Final Exam and Evaluations will be announced later, according to the decision of the Faculty Administrative Board.

	WITH PROGRAM LEARNING OUTCOMES COURSE LEARNING OUTCOMES RELATIONSHIP TABLE										
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
LO1	4	5	5	3	3	3	one	3	one	2	2
INCREASE 2	4	3	5	3	3	2	2	3	1	2	1
INCREASE 3	4	5	3	2	3	3	1	3	2	2	2
INCREASE 4	3	5	5	3	2	3	1	3	1	3	2
LO5	4	5	5	3	3	3	one	3	one	2	2
LO: Learning Outcomes OP: Program Outcomes											
Contribution Level	**1 Very Low**		**2 Low**		**3 Medium**		**4 High**		**5 Very High**		

Relation of Program Outcomes and Related Course

Lesson	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
Formal Languages and Automata Theory	4	5	5	3	3	3	one	3	one	2	2