Name of the course	Code	Term	T+P	Credit	ECTS
Theory of Computation			3+0	3	4

Prerequisites and co-requisities	

Language of the course	Turkish
Type of the course	Thecnical Elective
Course Coordinator	
Name of Lecturers	
Assistants	
Aim and goals of the course	This course aims to introduce basic concepts about the theory of computation and various computational models. By the end of this course students should be able to make use of alternative computational models during design of their solutions and understand emerging new computational models and assess their relative strengths and weeknesses.
Course Learning Outcomes	**Upon successful completion of the course, the students will be able to :** 1. Identify various computational models 2. Apply alternative computational models during design of their solutions 3. List relative strengths and weeknesses of compuational models 4. Identify various complexity classes
Contents of the course	Mathematical background, Finite automata: DFA, NFA, DFA = NFA, Regular expressions: Regular languages, Regular grammars, Closure, Pigeonhole principle, Pumping lemma, Context independent languages: Decomposition and Uncertainty, Trees Tree, Stacked automata, Context independent languages Turing Machine: Types of Turing Machine, Curch-Turing Thesis, Finishing Problem, Unresolved Problems, Computation Complexity: P-cluster, NP-cluster, Cook Theorem

Weeks	Subjects
1	Mathematical background
2	Finite Automata: DFA, NFA, DFAs = NDFAs, Their implementations
3	Finite Automata: cont.
4	Finite Automata: cont.
5	Regular expressions: Regular languages, Regular grammars, Closure, Pigeonhole principle, Pumping lemma,
6	Regular expressions: cont.
7	Context Free Languages: Parsing and ambiguity, Parse Trees, Pushdown automata, Pumping lemma for CFGs.
8	MIDTERM EXAM
9	Context Free Languages: cont.
10	Context Free Languages: cont.
11	Turing Machines: How to compute, Extensions of Turing Machines
12	Turing Machines: cont.
13	Curch-Turing Thesis, Halting Problem, Unsolvable Problems
14	Computational Complexity: P-class, NP-class, Cook's Theorem
15	FINAL EXAM

General Qualifications
In evaluations, it is an important measure that students should be able to use the terminology of automata and computation theory in their concept and field applications.
References
1. Introduction to Theory of Computation, by Michael Sipser, Thomson Course Technology, 2006. 2. Elements of the Theory of Computation, by H.R. Lewis and C.H. Papadimitriou, Prentice Hall, 1998

Evaluation
Midterm Exam: % 40, Final Exam: % 60. Project or homework evaluations can be made at the beginning of the semester.