Course Description Form	
Course Code and Name	BM312 FORMAL LANGUAGES AND AUTOMATA
Course Semester	6
Catalog Content	Sets and Relations, Formal Languages, Deterministic Finite Automata – DFA, Deterministic Finite Automata – DFA, Nondeterministic Finite Automata – NFA, Equivalence of DFA and NFA, Equivalence of DFA and NFA, Pumping Lemma, State Minimization, Context Free Grammars – CFG, Pushdown Automata – PDA, Turing Machines, Random Access Turing Machines – RATM, Church - Turing Thesis
Textbook	Introduction to the Theory of Computation (3rd Edition), Michael Sipser
Supplementary Textbooks	Puntambekar, A. A. (2008). Formal Languages and Automata Theory. Technical Publications. Linz, P. (2011). An introduction to formal languages and automata. Jones & Bartlett Publishers.
Credit	6
Prerequisites of the Course **(** *Attendance Requirements***)**	Prerequisites course: No Co-requisites: Obligatory course attendance 70%
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Classification of automata and formal languages, teaching regular expressions, teaching natural and formal languages, teaching independent languages from content, teaching Pushdown Automata and teaching Turing machines
Course Learning Outcomes	1. At the end of this course, the student will be able to define the definitions of machine models formally. 2. At the end of this course, the student will be able to synthesize finite automata with specific properties. 3. At the end of this course, the student will be able to apply transformation between multiple representations of finite automata.
Instruction Methods	The mode of delivery of this course is Face to face

Weekly Schedule	1. Week Sets and Relations 2. Week Formal Languages 3. Week Deterministic Finite Automata - DFA 4. Week Deterministic Finite Automata - DFA 5. Week Nondeterministic Finite Automata - NFA 6. Week Equivalence of DFA and NFA 7. Week Equivalence of DFA and NFA 8. Week Pumping Lemma 9. Week State Minimization 10. Week Context Free Grammars - CFG 11. Week Pushdown Automata - PDA 12. Week Turing Machines 13. Week Random Access Turing Machines - RATM 14. Week Church - Turing Thesis
Teaching and Learning Methods *(These are examples. Please fill which activities you use in the course)*	Weekly theoretical course hours: 3 Reading Activities Internet browsing, library work Designing and implementing materials Preparation of Midterm and Midterm Exam Final Exam and Preparation for Final Exam

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	30
Assignment	2	20
Application	0	0
Projects	0	0
Practice	0	0
Quiz	4	10
Percent of In-term Studies (%)		60
Percentage of Final Exam to Total Score (%)		40
Attendance		-

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	3	42
Weekly Tutorial Hours	0	0	0
Reading Tasks	14	1	14
Studies	1	10	10
Material Design and Implementation	3	15	45
Report Preparing	0	0	0
Preparing a Presentation	0	0	0
Presentations	0	0	0
Midterm Exam and Preparation for Midterm Exam	1	19	19
Final Exam and Preparation for Final Exam	1	20	20
Other (should be emphasized)	0	0	0
Total Workload			150
Total Workload / 25			6
Course Credit (ECTS)			6

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Sufficient knowledge on mathematics, science and computer engineering; ability to apply theoretical and practical knowledge in these areas to model and solve engineering problems					X
2	Ability to identify, define, formulate and solve complex engineering problems; ability to choose and apply appropriate analysis and modelling methods for these purposes					X
3	Ability to design a complex system, process, device, software, algorithm, or product under realistic constraints and circumstances to meet certain requirements; ability to apply modern design techniques for this purpose				X	
4	Ability to choose, develop and use modern techniques and tools necessary for engineering applications; ability to effectively use computing technologies					
5	Ability to design and implement systems or experiments to solve engineering problems, collect and interpret data to evaluate and analyze the results of solutions					
6	Ability to work effectively in intradisciplinary and interdisciplinary teams or individually					

	7	Ability to efficiently prepare, evaluate and interpret reports					
	8	Ability to make presentations and conduct effective verbal and written communication in Turkish and English					
	9	Awareness of the necessity of lifelong learning; ability to access information, follow scientific and technological developments; ability to perpetually renew oneself					
	10	Awareness of professional and ethical responsibility, ability to act in accordance with ethical principles					
	11	Ability to apply knowledge on project management, risk management and change management					
	12	Awareness of entrepreneurship and innovation, ability to design and build sustainable systems					
	13	Ability to devise local and global solutions to contemporary issues considering the effects of engineering applications on health, environment and security					
	14	Awareness of the legal consequences of engineering solutions					
	15	Ability to apply knowledge on software development process and documentation rules					
	16	Knowledge on standards used in engineering applications					
	17	Awareness of occupational health and security, information security and privacy					
The Course's Lecturer(s) and Contact Information	Asst. Prof. Dr. Mehmet DEMİRCİ mdemirci@gazi.edu.tr						