Course Description Form	
Course Code and Name	CENG368 ALGORITHM ANALYSIS AND DESIGN (TECH.ELECT.)
Course Semester	6
Catalog Content	Algorithm efficiency, Mathematical analysis of algorithms, Dynamic programming algorithms
Textbook	Algorithm Design by Jon Kleinberg, Éva Tardos, 2005.
Supplementary Textbooks	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein., Introduction to Algorithms. 2nd Edition, McGraw Hill, 2001. Sedgewick, Robert, Algorithms in C++, Addison-Wesley, 2001.
Credit	6
Prerequisites of the Course (*Attendance Requirements*)	There is no prerequisite or co-requisite for this course.
Type of the Course	Elective
Instruction Language	English
Course Objectives	Analyzing the complexity and efficiency of algorithms, designing efficient algorithms
Course Learning Outcomes	1.Algorithm effectiveness 2.Analysis of computer algorithms 3.Classification, search, paging and parallel 4.Analysis of mathematical algorithms 5.Game and puzzle, network algorithms and probability algorithm analysis 6.Convert and manage approach using Divide and conquer 7.Principal graph structures, functions and algorithms 8.Random algorithms and analysis 9.Dynamic programming algorithms
Instruction Methods	The mode of delivery of this course is face to face.
Weekly Schedule	1.Week: Algorithm efficiency 2.Week: Big-O and Big-Theta notation, Master theorem 3.Week: Classification, search, paging, and parallelization 4.Week: Classification, search, paging, and parallelization 5.Week: Mathematical analysis of algorithms 6.Week: Mathematical analysis of algorithms 7.Week: Games and puzzles, network algorithms and probability analysis of algorithms 8.Week: Games and puzzles, network algorithms and probability analysis of algorithms 9.Week: Divide and conquer approaches 10.Week: Divide and conquer approaches 11.Week: Basic graph structures, functions and algorithms 12.Week: Basic graph structures, functions and algorithms 13.Week: Random algorithms and analysis 14.Week: Dynamic programming algorithms

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 Preparation of Midterm and Midterm Exam Final Exam and Preparation for Final Exam			
Assessment Criteria		**Numbers**	**Total Weighting (%)**	
	Midterm Exams	1	30	
	Assignment	5	30	
	Application			
	Projects			
	Practice			
	Quiz			
	Percent of In-term Studies (%)		60	
	Percentage of Final Exam to Total Score (%)		40	
	Attendance			

	Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Workload	Weekly Theoretical Course Hours	14	3	42
	Weekly Tutorial Hours			
	Reading Tasks	12	4	48
	Studies	10	3	30
	Material Design and Implementation			
	Report Preparing			
	Preparing a Presentation			
	Presentations			
	Midterm Exam and Preparation for Midterm Exam	1	15	15
	Final Exam and Preparation for Final Exam	1	15	15
	Other (should be emphasized)			
	Total Workload			150
	Total Workload / 25			6
	Course Credit (ECTS)			6

	No	Program Outcomes	1	2	3	4	5
Contribution Level Between Course Learning Outcomes and Program Outcomes	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				X	
	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		X			
	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	Computer Engineering Department Chair bmbb@gazi.edu.tr