COURSE DESCRIPTION FORM			
Course Code and Name	BM218 ALGORITHM DESIGN AND ANALYSIS		
Course Semester	4		
Catalogue Data of the Course (*Course Content*)	Complexity analysis, search and sorting algorithms, tree and graph algorithms, dynamic programming, greedy algorithms, complexity classes, P and NP		
Course Textbooks	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Introduction to Algorithms (3rd edition), MIT Press, 2009.		
Supplementary Textbooks	J. Kleinberg, E. Tardos. Algorithm Design. Addison-Wesley, 2005. Sara Baase, Allen Van Gelder, Computer Algorithms: Introduction to Design and Analysis (3rd edition), Addison-Wesley, 2000.		
Credit (*ECTS*)	6		
Prerequisites for the Course (*Attendance Requirements*)	CENG205 Data Structures is a prerequisite. %70 attendance is required.		
Course Type	Compulsory		
Language of Instruction	Turkish		
Course Objectives	It is aimed to provide students with the ability to understand, select, design and evaluate algorithms.		
Course Learning Outcomes	Students taking this course 1. Understand problem solving techniques, 2. Compare different problem solving techniques, 3. Design an algorithm to solve a given problem, 4. Perform time complexity analysis of algorithms, 5. Classify algorithms in terms of complexity.		
Instruction Method *(Face-to-face, Distance education etc.)*	Face to face		
Weekly Schedule of the Course	Week 1: Introduction to problem solving and algorithms Week 2: Complexity analysis Week 3: Complexity analysis Week 4: Search problem and binary search trees Week 5: Sorting problem and algorithms Week 6: Sorting problem and algorithms Week 7: Trees and tree algorithms Week 8: Trees and tree algorithms Week 9: Graphs and graph algorithms Week 10: Graphs and graph algorithms Week 11: Dynamic programming Week 12: Dynamic programming Week 13: Greedy algorithms Week 14: Complexity classes, P and NP		
Teaching Activities *(The time spent for the activities listed here will determine the amount of credit required)*	Weekly theoretical course hours: 3 Reading activities Internet search and library work Designing and implementing materials Midterm and revision for midterm Final exam and revision for final exam		
Assessment Criteria		**Number(s)**	**Weight (%)**

Midterm exam	1	40
Assignment	4	20
Application		
Project		
Practice		
Quiz		
Final exam		40
Total		100

Workload of the Course

Activity	Number of Weeks	Duration (Weekly Hour)	End of Semester Total Workload
Weekly theoretical course hours	14	3	42
Weekly practical course hours			
Reading activities	12	2	24
Internet search and library work	12	3	36
Designing and implementing materials	4	5	20
Making a report			
Preparing and making presentations			
Midterm and revision for midterm	1	15	15
Final exam and revision for final exam	1	15	15
Total workload			152
Total workload/ 25			6,08
Course Credit (ECTS)			6

Contribution Level between Course Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Knowledge of mathematics, science, basic engineering, computing, and computer engineering; ability to use this knowledge in solving complex engineering problems.					X
2	Ability to define, formulate and analyze complex engineering problems using basic science, mathematics and engineering knowledge and considering the UN Sustainable Development Goals relevant to the problems addressed.					X
3	Ability to design creative solutions to complex engineering problems; ability to design complex systems, processes, devices, software, algorithms or products to meet current and future requirements, considering realistic constraints and conditions.					X
4	Ability to select, use and develop appropriate techniques, resources and modern engineering and informatics tools, including estimation and modeling, for the analysis and solution of complex engineering problems while being aware of their limitations.					X
5	Ability to use research methods to examine complex engineering problems or research topics in computer engineering, including reviewing the literature, designing experiments, conducting experiments, collecting data, analyzing and interpreting results.			X		
6	Knowledge of the effects of engineering practices and the standards used in these practices on society, health and safety, economy, sustainability and environment					

	within the scope of the UN Sustainable Development Goals; awareness of the consequences of engineering solutions in the fields of information security and law.						
7	Acting in accordance with engineering professional principles and knowledge on ethical responsibility; awareness of acting impartially, without discrimination on any issue, and being inclusive of diversity.		X				
8	Ability to work effectively individually and as a team member or leader in intradisciplinary and multidisciplinary teams (face-to-face, remote, or hybrid).						
9	Ability to conduct effective verbal and written communication on technical issues in Turkish or English, prepare reports, make effective presentations and prepare software documentation, considering the various differences of the target audience (such as education, language, profession).		X				
10	Knowledge of business practices such as project, risk and change management and economic feasibility analysis; awareness of entrepreneurship and innovation.						
11	Lifelong learning skill that includes the ability to learn independently and continuously, to adapt to new and developing scientific practices and technologies, and to think inquisitively about technological changes.		X				

Lecturer(s) and Contact Information	Assoc. Prof. Dr. Mehmet DEMİRCİ mdemirci@gazi.edu.tr