COURSE DESCRIPTION FORM	
Course Code and Name	CENG488 OPERATIONS RESEARCH (TECH.ELECT.)
Course Semester	8
Catalogue Data of the Course (*Course Content*)	Introduction: basic definitions, OR approach to problem solving and its steps. Mathematical modeling and types, Linear programming: modeling and types, Linear programming solution techniques: geometric. Linear programming solution techniques: algebraic. Simplex method, Sensitivity analysis in linear programming: graphical and algebraic techniques, Integer programming: modelling and types. Integer programming: solution techniques, Dynamic programming I: deterministic, Dynamic programming I: probabilistic, Queuing problems, Game theory, Decision making under uncertainty, Network problems
Course Textbooks	Hiller, F.S. and Lieberman, G.J., Introduction to Operations Research (9th ed.), McGraw-Hill, 2009
Supplementary Textbooks	Winston, W.L., Introduction to Mathematical Programming (4th ed.), Duxbury Press, 2002 Ivancevich J. Ivancevich J. Human Resource Management. 9th ed. Mc Graw Hill. 2003.
Credit (*ECTS*)	6
Prerequisites for the Course (*Attendance Requirements*)	There is no prerequisite or co-requisite for this course.
Course Type	Elective
Language of Instruction	English
Course Objectives	Explaining the concept of operations research Introducing the concept and methods of linear programming Interpret and analyze the solutions obtained after the optimization process.
Course Learning Outcomes	1. Defines the concept of operations research 2. Applies the concept and methods of linear programming 3. interprets and analyzes the solutions obtained after the optimization process
Instruction Method (*Face-to-face, Distance education etc.*)	The mode of delivery of this course is face to face.
Weekly Schedule of the Course	1. Week: Basic definitions, OR approach to problem solving and its steps. 2. Week: Mathematical modeling and types 3. Week: Linear programming: modeling and types 4. Week: Linear programming solution techniques: geometric. 5. Week: Linear programming solution techniques 6. Week: Sensitivity analysis in linear programming 7. Week: Integer programming: modelling and types. 8. Week: Integer programming: solution techniques. 9. Week: Dynamic programming I: deterministic. 10. Week: Dynamic programming II: probabilistic. 11. Week: Queuing problems 12. Week: Game theory 13. Week: Decision making under uncertainty 14. Week: Network problems
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 Making a report Preparing and making presentations Midterm and revision for midterm Final exam and revision for final exam

Assessment Criteria			Number(s)	Weight (%)	
		Midterm exam	1	30	
		Assignment	2	10	
		Application			
		Project			
		Practice			
		Quiz	2	20	
		Final exam	1	40	
		Total	6	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	0	0	0	
		Reading activities	10	3	30	
		Internet search and library work	8	2	16	
		Designing and implementing materials	5	3	15	
		Making a report	4	4	16	
		Preparing and making presentations	2	6	12	
		Midterm and revision for midterm	1	7	7	
		Final exam and revision for final exam	1	12	12	
		Total workload			150	
		Total workload/ 25			6	
		Course Credit (ECTS)			6	

Contribution Level between Course Outcomes and Program Outcomes		No	Program Çıktıları	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.						
		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					x	

#	Outcome						
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.			x			
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.						
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.				x		
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.						

Lecturer(s) and Contact Information	Prof. Dr. Hacer KARACAN hkaracan@gazi.edu.tr