Course Description Form	
Course Code and Name	CENG488 OPERATIONS RESEARCH (TECH.ELECT.)
Course Semester	8
Catalog 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
Textbook	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	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	Teaching operations research concept, the linear programming concept and methods, and being able to interpret and analyze the optimization results are among the objectives of this course.
Course Learning Outcomes	At the end of the course, the students will be able to 1. understand the operations research concept 2. understand the linear programming concept and methods, and 3. be able to interpret and analyze the optimization results.
Instruction Methods	The mode of delivery of this course is Face to face
Weekly Schedule	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 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
Report preparing
Preparing a Presentation
Presentations
Preparation of Midterm and Midterm Exam
Final Exam and Preparation for Final Exam

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	2	30
Assignment	2	10
Application		
Projects		
Practice		
Quiz	2	20
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			
Reading Tasks	10	3	30
Studies	8	2	16
Material Design and Implementation	5	3	15
Report Preparing	4	4	16
Preparing a Presentation	2	3	6
Presentations	2	3	6
Midterm Exam and Preparation for Midterm Exam	1	7	7
Final Exam and Preparation for Final Exam	2	6	12
Other (should be emphasized)			
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			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	X				
	7	Ability to efficiently prepare, evaluate and interpret reports		X			
	8	Ability to make presentations and conduct effective verbal and written communication in Turkish and English		X			
	9	Awareness of the necessity of lifelong learning; ability to access information, follow scientific and technological developments; ability to perpetually renew oneself			X		
	10	Awareness of professional and ethical responsibility, ability to act in accordance with ethical principles				X	
	11	Ability to apply knowledge on project management, risk management and change management				X	
	12	Awareness of entrepreneurship and innovation, ability to design and build sustainable systems		X			
	13	Ability to devise local and global solutions to contemporary issues considering the effects of engineering applications on health, environment and security		X			
	14	Awareness of the legal consequences of engineering solutions	X				
	15	Ability to apply knowledge on software development process and documentation rules	X				
	16	Knowledge on standards used in engineering applications		X			
	17	Awareness of occupational health and security, information security and privacy	X				
The Course's Lecturer(s) and Contact Information		Assoc. Prof. Dr. Mehmet ATAK matak@gazi.edu.tr					