

COURSE DESCRIPTION FORM

Course Code and Title	KM493 INTRODUCTION TO OPTIMIZATION	
Course Semester	7	
Catalog Description (Content) of the Course	Optimization and it's development. Engineering applications of optimization. Classification of optimization problem. Linear programming, non-linear programming. Some important unconstrained and constrained optimization techniques. The examples of optimization for specific individual processes.	
Main Textbook	1. T.F. Edger, D.M. Himmelblau and L.S. Laston, Optimization of chemical processes, Second Ed., 2001,	
Supporting Textbooks	1. Rao, S.S., Optimization: Theory and Applications, Second Ed., John Wiley, New York, 1984. 2. Bunday B.D., Basic Optimization Methods, Edward Arnold Publ., 1985. 3. Edwin K. P. Chong, Stanislaw H. Zak, An Introduction to Optimization, Wiley Interscience, 2001. 4. Achille Messac, Optimization in Practice with MATLAB: For Engineering Students and Professionals, Cambridge University Press, 2015.	
Course Credit (ECTS)	4	
Prerequisites of the Course (Compulsory attendance should be indicated here.)	There is no prerequisite for this course, Compulsory attendance (70 %) It is recommended to take Numerical Analysis Methods	
Type of the Course	Elective	
Instruction Language of the Course	İngilizce	
Object and Target of the Course	To apply optimization techniques to various engineering problems	
Learning Outcomes of the Course	To express an optimization problems mathematically, to gain the problem solving skill by combining the formulation of optimization problems and existing solution possibilities, to solve optimization problems by computer numerically, to adapt the optimization techniques into the engineering problems	
Mode of Delivery	Face to Face	
Weekly Schedule of the Course	Weeks	Topics
	1	Nature and organization of an optimization problem
	2	Curve fitting
	3	Curve fitting
	4	Formulation of objective functions
	5	Formulation of objective functions
	6	Formulation of objective functions
	7	Midterm Exam I
	8	Linear programming and its applications
	9	Linear programming and its applications
	10	Linear programming and its applications
	11	Linear programming and its applications
	12	Midterm Exam II
	13	Nonlinear programming methods
	14	Nonlinear programming methods
Educative Activities (Credit will be determined based on the time given for these activities. Should be filled carefully.)	Theoretical Study Hours of Course Per Week Reading Searching in Internet and Library Preparing Reports Preparing Presentation Presentation Mid-Term and Studying for Mid-Term Final and Studying for Final	

Assessment Criteria			Sayı	Toplam Katkı (%)					
	Midterm		2	25					
	Homework								
	Assignment								
	Projects		1	10					
	Practice								
	Quiz								
	Contribution of In-term Studies to Overall Grade		60						
	Contribution of Final Examination to Overall Grade		40						
	Attendance								
Workload of the Course	Ekinlik	Hafta sayısı	Süre Saat/Hafta	D.Sonu toplam iş yükü					
	Theoretical Study Hours of Course Per Week	14	3	42					
	Practising Hours of Course Per Week								
	Reading	7	2	14					
	Searching in Internet and Library	7	2	14					
	Designing and Applying Materials								
	Preparing Reports	1	6	6					
	Preparing Presentation	1	6	6					
	Presentation	1	1	1					
	Mid-Term and Studying for Mid-Term	2	6	12					
	Final and Studying for Final	1	5	5					
	Other								
	Total Workload			100					
	Workload / 25			4					
	ECTS Credit			4					
Course's Contribution To Program	Num.	Program Ourcomes			1	2	3	4	5
	1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.					×		
	2	Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.				×			
	3	Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.				×			
	4	Ability to devise, select, and use modern techniques and tools needed for engineering practice; ability to employ information technologies effectively.						×	
	5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating engineering problems.					×		
	6	Ability to work efficiently in intra-disciplinary teams.			×				
	7	Ability to work efficiently in multi-disciplinary teams; ability to work individually.			×				
	8	Ability to work individually.					×		
	9	Ability to communicate effectively in Turkish/English, both orally and in writing; Ability to write effective reports and comprehend written reports, make effective presentations					×		
	10	prepare design and production reports, give and receive clear and intelligible instructions.					×		
	11	Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.					×		
	12	Awareness of professional and ethical responsibility.				×			

	13	Information about business life practices such as project management, risk management, and change management.	×				
	14	Information about awareness of entrepreneurship, innovation, and sustainable development.	×				
	15	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.	×				
	16	Knowledge about awareness of the legal consequences of engineering solutions.	×				
	17	Knowledge on standards used in engineering practice.	X				
Name of Lecturer(s) and Contact Information		1. Prof. Dr. Muzaffer BALBAŞI , mbalbasi@gazi.edu.tr					