

Course Description					
Name	Code	Semester	T+A Hour	Credit	ECTS
INTRODUCTION to MODELLING and OPTIMIZATION	IND2249050	Spring Semester	3+2	4	8
Prerequisites Courses	LİNEER CEBİR; LİNEER CEBİR VE DİFERANSİYEL DENKLEMLER				
Recommended Elective Courses					
Language of Instruction	English				
Course Level	First Cycle (Bachelor's Degree)				
Course Type	Required				
Course Coordinator	Assoc.Prof. Yasin GÖÇGÜN				
Name of Lecturer(s)	Prof.Dr. Hakan TOZAN, Assist.Prof. İrem DÜZDAR ARGUN				
Assistant(s)					
Aim	The aim and objective of this course are to teach. how to formulate and analyze mathematical models (with selected real-world applications)and, mathematical tools to handle linear programming and network problems (the simplex method, duality, sensitivity analysis, and related topics, network models, and project scheduling).				
Course Content	This course contains; Introduction to Model Building,Basic Linear Algebra,Introduction to Linear Programming,Convex Sets and Functions, Extreme Points and Optimality, Graphical Solution,Graphical Sensitivity Analysis and Computer Based Solutions,Simplex Algorithm,Simplex Algorithm: Artificial Starting Solutions,Simplex Algorithm: Artificial Starting Solutions and Special Cases in Simplex,Revised Simplex ,Special Simplex Implementations: Karus-Kuhn-Tucker Optimality Conditions,Duality and Sensitivity,Duality and Sensitivity: Dual Simplex,Transportation and Assignment Problems,Transportation and Assignment Problems.				
Course Learning Outcomes			Teaching Methods	Assessment Methods	
			1, 12, 14, 15, 2, 4, 6	A, C, E, F	
			1, 12, 14, 15, 2, 4, 6	A, C, F	
			1, 14, 15, 2, 4, 6, 9	A, E	
			1, 14, 15, 2, 6	E	
			1, 14, 15, 2	A	
			1, 14, 15, 2, 4	A	
Teaching Methods	1: Lecture, 12: Case study, 14: Self-Study, 15: Problem solving, 2: Question - Answer, 4: Exercise, Practice, 6: Role Model, Making an example, 9: Simulation				
Assessment Methods	A: Written Exam, C: Homework, E: Quiz, F: Performance task				
Lecture Schedule					
Sequence	Topics	Preliminary Preparation			
1	Introduction to Model Building				
2	Basic Linear Algebra				
3	Introduction to Linear Programming				
4	Convex Sets and Functions, Extreme Points and Optimality, Graphical Solution				
5	Graphical Sensitivity Analysis and Computer Based Solutions				
6	Simplex Algorithm				
7	Simplex Algorithm: Artificial Starting Solutions				
8	Simplex Algorithm: Artificial Starting Solutions and Special Cases in Simplex				
9	Revised Simplex				
10	Special Simplex Implementations: Karus-Kuhn-Tucker Optimality Conditions				
11	Duality and Sensitivity				
12	Duality and Sensitivity: Dual Simplex				
13	Transportation and Assignment Problems				
14	Transportation and Assignment Problems				
Evaluation Methods		Weight(%)			
Midterm Exam		30			
General Exam		70			

Resources
Taha, Hamdy A., Operations Research, 8th edition, 2007. ISBN: 0131360140Winston, Wayne L., Operations Research: Applications and Algorithms, 4th edition, 2003. ISBN-13: 978-0534380588 (Course notes and other material may be provided by the instructor)