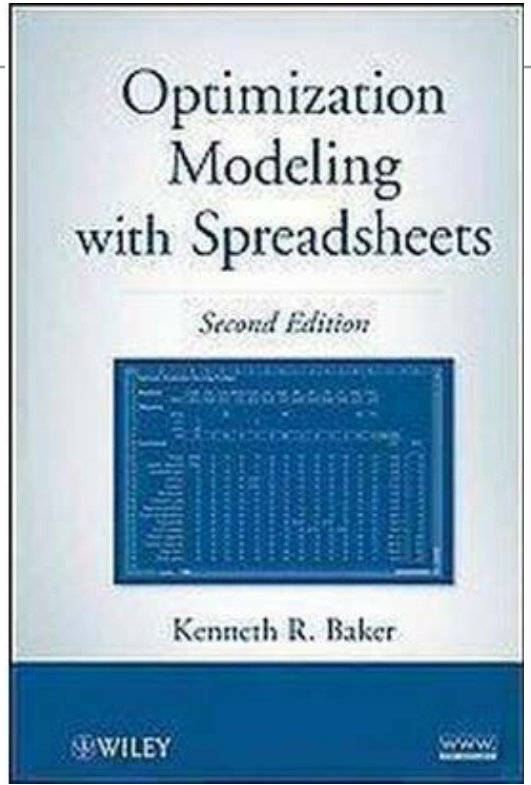
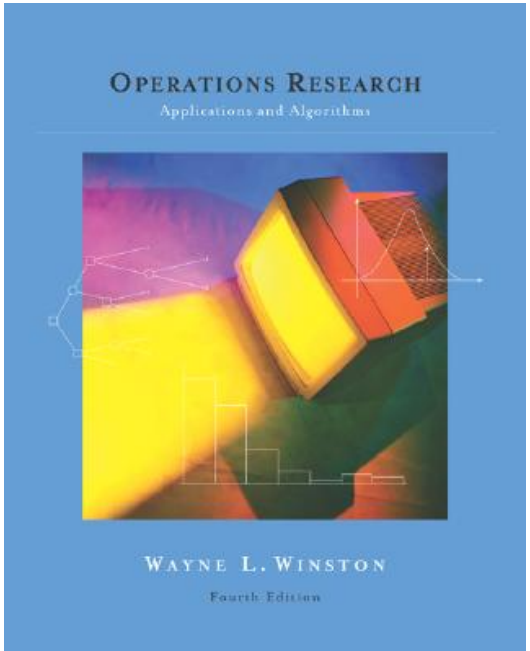
BLG 368E
Operations Research
(Yöneylem Araştırması)

Dr. Serkan Türkeli

Scope, Purpose and Description	Optimization is the mathematical discipline which is concerned with finding the maxima and minima of functions, possibly subject to constraints. This course provides the student with a collection of optimization modeling and solution tools that can be useful in a variety of industries and functions. Students will learn linear programming, nonlinear programming, integer programming, and combinatorial programming. The course emphasizes the use of spreadsheets and expands the student's capabilities in using Risk Solver Platform software

Required Readings	Optimization Modeling with Spreadsheets (Second Edition) by Kenneth Baker, 2011 (John Wiley & Sons) Winston W.L. (2004) “Operations Research: Applications and Algorithms” Prof. Dr. İlker Topçu Ders Notları





Grading Criteria	Students will be evaluated using the following criteria: **Homework, Active, Meaningful Participation, 25%** Midterm 35% **Final** 40% Note: To pass this course you must get at least 40% in the final exam.

Course Schedule	
Week 1:	**Introduction and Overview** Course Introduction Student Introduction **Introduction to Optimization** **Introduction to Spreadsheet Models for Optimization**
Week 2:	**Linear Programming: Allocation, Covering, and Blending Models**
Week 3:	**Linear Programming: Network Models-Special Network Models**
Week 4:	**Linear Programming: Network Models-General Network Models**
Week 5:	**Sensitivity Analysis in Linear Programs**
Week 6:	**Patterns,** **Nonlinear Programming Models**
Week 7:	*Midterm1*

Week 8:	**Portfolio Model**
Week 9:	**Integer Programming: Binary Choice Models**
Week 10:	**Integer Programming: Logical Constraints Location Models**
Week 11:	**Nonlinear Programming**
Week 12:	**Heuristic Solutions with the Evolutionary Solver- Traveling Salesperson Problem**
Week 13:	**Cluster Analysis**
Week 14:	**Final**

Objectives and Goal

At the end of this course, students will be able to

- Translate a verbal or graphical description of a decision problem into a valid optimization model (by identifying variables, constraints, and an objective function)
- Interpret the meaning and assess the validity of a particular optimization model.
- Express a given optimization model in an Excel spreadsheet.
- Find solutions to optimization problems using the most appropriate algorithm.
- Perform sensitivity analysis by tracing the effects of varying a parameter on the optimal decision variables and the objective function.

First assignment

- How do you define problem? Define problem solving process.
- What is the meaning of decision? Define bounded rationality.
- Prepare at least 10 slide presentation. Students will be randomly selected for each presentation date.

  Bir sorunu nasıl tanımlıyorsunuz? Sorun nedir? Çözüm aşamaları nelerdir? (Derse katılımınız ve örnek soruların çözümü ile yapılacaktır)
- Karar nedir? Kısıtlı rasyonellik nedir?
  (Herkes 10 slayttan oluşan sunum hazırlayacak, rastgele seçilen bir öğrenci derste sunum yapacaktır)

Contact

Contact:	**Dr. Serkan Türkeli** **E-posta: serkanturkeli@yahoo.com** **sturkeli@itu.edu.tr**
Office hour	Tuesday 9.30-12.30 (Please send an email for appointment)