BOĞAZİÇİ UNIVERSITY
DEPARTMENT OF INDUSTRIAL ENGINEERING
Fall 2018 – 2019
IE 501 OPTIMIZATION TECHNIQUES I

Day and Time : M 09:00 – 11:00 T 09:00 – 11:00
Classroom : M 2181 M 3120
Instructor : İ. Kuban Altınel
Office/Phone : Old Engineering Building, M 4034 / Ext. 6407
Office Hours : TBA
Teaching Assistant : Pınar Dursun
Office : M 4040
Office Hours : TBA
Grading

- Quizzes : 10% per quiz (2 midterm-like quizzes), Close book.
- Homeworks : 10% (Almost every other week. Assignment will be due one week after they are given out unless otherwise specified). NO LATE HOMEWORK!
- Midterm : 25%, Close book.
  - Eligibility : Any registered student may take the midterm exam.
  - Makeup : NO MAKEUP! ABSENCE WILL BE GIVEN 0 WHATEVER THE REASON IS.
- Final : 40%, Open book.
  - Eligibility : Only registered students with a 70 overall weighted average or above, if they were given full grade at the final exam, e.g. 100, may enter.
  - Makeup : Only registered students who are eligible to take the final will be given a makeup exam if he/she fails the course or he/she is absent at the final exam with an officially accepted excuse.
- Attendance : 5%

Textbook: Bertsimas, D. and Tsitliklis, J.N., Introduction to Linear Optimization, 1997

References:
1. Bazaraa, M. S., Jarvis, J. J., Sherali, H. D., Linear Programming and Network Flows, 4th edition
2. Bazaraa, M. S., Jarvis, J. J., Sherali, H. D., Linear Programming and Network Flows, 2nd edition
3. Padberg, M. Linear Optimization and Extensions
4. M. Sipser, Introduction to the theory of computing
5. Garey, M. and Johnson, D., Computers and Intractability
6. Brooke, A., Kendrick, D. and Meeraus, A., GAMS: A User's Guide
7. Lang, S., Linear Algebra

They are available **ON RESERVE** at the library

COURSE OUTLINE

1. Introduction: Mathematical models (Bertsimas, Tsitliklis Ch. 1, 12; Bazaraa, Jarvis, Sherali Ch. 1)
2. Introduction: Mathematical foundations (Bertsimas, Tsitliklis Ch. 1, 2; Lang Ch. 1 – 6, 12; Padberg Ch. 7; Bazaraa, Jarvis, Sherali Ch. 2)
3. The Simplex Algorithm (Bertsimas, Tsitliklis Ch. 3)
4. Modeling with GAMS (Brooke, Kendrick, Meeraus Part I – II)
5. Algorithmic Efficiency and the Computational Cost of the Simplex Algorithm (Bertsimas, Tsitliklis Ch. 3; Bazaraa, Jarvis, Sherali Ch. 8)
6. Various Implementations of the Simplex Method (Bazaraa, Jarvis, Sherali Ch. 5)
7. Duality (Bertsimas, Tsitliklis Ch. 4,)
8. Sensitivity Analysis (Bertsimas, Tsitliklis Ch. 5)
9. Computational Complexity (Garey, Johnson Ch. 1 – 3, Sipser Ch. 3.1, 3.3, 4.2, 7)
10. Complexity of Linear Programming Problem (Bertsimas, Tsitliklis Ch. 8)
11. Interior Point Methods (Bertsimas, Tsitliklis Ch. 9)
12. The Decomposition Principle (Bertsimas, Tsitliklis Ch. 6; Bazaraa, Jarvis, Sherali Ch. 7)
13. Karush – Kuhn –Tucker Optimality Conditions for Convex Programming

IE 501 TENTATIVE PROGRAM

WEEK	MONTH	DAY	TENTATIVE DAILY OUTLINE
1	September	24M	Introduction: Mathematical models
		25T	Introduction: Mathematical models
2	October	01M	Introduction: Mathematical foundations
		02T	Introduction: Mathematical foundations
3		08M	Introduction: Mathematical foundations
		09T	Introduction: Mathematical foundations
4		15M	Simplex Algorithm
		16T	Simplex Algorithm
5		22M	Simplex Algorithm
		23T	Simplex Algorithm
6		29M	REPUBLIC HOLIDAY
		30T	Modeling with GAMS
7	November	05M	Algorithmic Efficiency, Comp. Cost of the Simplex Algorithm
		06T	Algorithmic Efficiency, Comp. Cost of the Simplex Algorithm
8		12M	Various Implementations of the Simplex Method
		13T	Duality
9		19M	Duality
		20T	Sensitivity Analysis
10		26M	Computational Complexity
		27T	Computational Complexity
11	December	03M	Computational Complexity
		04T	Complexity of Linear Programming Problem
12		10M	Interior Point Methods
		11T	Interior Point Methods
13		17M	Decomposition Principle
		18T	Decomposition Principle