

APPROXIMATION ALGORITHMS COURSE INFORMATION

Instructor: Assoc. Prof. Dr. Orhan Dagdeviren (<http://netos.ube.ege.edu.tr/dagdeviren.html>)

Course Web Page: <http://netos.ube.ege.edu.tr/courses.html>

Time: Thursday, 13:30-16:00

Assistant: Res. Ass. Dr. Gul Boztok Algin (gul.boztok@ege.edu.tr)

Aim and Content:

- This course aims to study approximation algorithm design and analysis.
- The course will especially cover graph theory and related problems.

Course Materials: We will study mainly on Kleinberg and Tardos's Algorithm Design (Book 1) and Vijay V. Vazirani's Approximation Algorithms (Book 2) books.

Supplementary Materials (Not Full List):

1. David P. Williamson and David B. Shmoys. 2011. The Design of Approximation Algorithms (1st ed.). Cambridge University Press, New York, NY, USA.
2. Ding-Zhu Du, Ker-I Ko, and Xiaodong Hu. 2011. Design and Analysis of Approximation Algorithms. Springer Publishing Company, Incorporated.
3. Teofilo F. Gonzalez. 2007. Handbook of Approximation Algorithms and Metaheuristics (Chapman & Hall/Crc Computer & Information Science Series). Chapman & Hall/CRC.

List of Topics:

Part 1 (Book 1)

1. Introduction
2. Basics of Algorithm Analysis
3. Graphs
4. Greedy Algorithms
5. Divide and Conquer
6. Dynamic Programming
7. Network Flow
8. NP and Computational Intractability
9. PSPACE
10. Extending the Limits of Tractability
11. Approximation Algorithms

Part 2 (Book 2)

12. Introduction
13. Set Cover
14. Steiner Tree and TSP
15. Multiway Cut and k-Cut
16. k-Center
17. Feedback Vertex Set

Tentative Grading:

Coding Homeworks: 15 %

Written Homeworks: 20 %

Final: 30 %

Project: 20 %

Paper Presentation: 15 %

Attendance.