

CO 450/CO 650 Combinatorial Optimization – Fall 2012

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Prerequisite: Knowledge of linear programming at the level of CO350 or higher. Knowledge of basic graph theory.

Course Outline

Combinatorial Optimization is a field that combines techniques from linear programming, combinatorics and algorithms to find the optimal solution of optimization problems over discrete sets. Typically, we are given a finite set and a cost function that assigns a cost to each element of the set and we are interested in finding the minimum cost element of that set in an efficient manner. Since the set we are interested in is usually not given explicitly, but in an implicit and efficient way, checking each element's cost is typically prohibitive. So, while it is hopeless to solve this problem without knowing anything about the structure of our set, in this course we will see a few of the basic discrete optimization problems that we can efficiently solve/approximate and develop the tools to understand how we can do so.

Topics will include: Matchings, T-joins, TSP, Spanning Trees, Matroids.

Books and Supplementary Material

There is no prescribed textbook for this course. The following books may be used as a reference book.

- Combinatorial Optimization, W. Cook, W. Cunningham, W. Pulleyblank and A. Schrijver. Wiley-Interscience, 1997.

This book is on reserve at the library.

Grading

The final grade in the course will be calculated as follows:

Homework Assignments 50%
Final Exam 50 %

Collaboration and acceptable sources of help: No collaboration is allowed unless otherwise stated! The only acceptable sources of help you may get is myself, your course notes and the above textbook. Cheating will yield a mark of 0 in the corresponding assignment and will be reported to the appropriate Associate Dean.