

## Approximation Algorithms

Approximation Algorithms: Introduction to Integer Program and LP-relaxation, LP - rounding for Vertex Cover, Bin-Packing and LP -rounding, Randomized rounding for Set Cover and Multiway Cut;

Greedy algorithm and Dynamic Programming for Knapsack problems.

Linear programming and Duality, Complementary Slackness Conditions, Weak duality and Strong Duality Theorems: Vertex Cover and Matching; Primal-Dual Approximation Algorithms: Steiner Forest, Facility Location and k-Median.

Reading Material:

1. Vijay V. Vazirani, **Approximation Algorithms**, Springer, 2013.
2. David P. Williamson and David B. Shmoys, **The Design of Approximation Algorithms**, Cambridge University Press, 2011.
3. Research Papers.