Lecturer: Dr. Song Wang (Optimization)
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Lecture times: Optimization: Monday at 12 noon in WBLT.

Practice Classes: Optimization: Thursdays of Teaching Weeks 4, 8 and 13, at 1pm in WBLT.

Problem sheets will be posted on the Website in due course.

Assessment: Three hour exam (70%). Three class tests (30%): 2 on Prob/Stats and 1 on optimization. The optimisation test will be roughly in Teaching Week 9.

Textbook: No textbook is needed for optimisation. An electronic version of my notes is available on the Web. Also, various on-line lecture notes are available. Please check the web site for details.


M2218 Course Outline: Optimisation
The following topics will be covered with some approximate numbers of lectures shown.

1. Introduction: motivation & examples. .................................................. 1
2. Basics of network flows: terminology, connectedness, spanning trees, incidence matrices, flows, capacity, divergence .................................................. 1
3. Minimum spanning trees: Krushal and Prim algorithms. ......................... 1
4. Maximum flow problems: max-flow min-cut theorem, the labeling method, augmenting path algorithm. .................................................. 1
5. Minimum cost flow problems. .............................................................. 1
6. Shortest path: Dijkstra’s algorithm. ...................................................... 1
7. Introduction to convex optimization theory: convex set, hyperplane, polytope, polyhedron, extreme points etc. ........................................ 1
8. Basics of linear programming: standard form, slack variables, feasible solution, fundamental theorems. .................................................. 1
9. The simplex method: matrix formulation, choice of leaving basic variable, pivoting, simplex tableau, optimality condition, artificial variables, 2 phase simplex method. ... 3
10. Sensibility analysis. ................................................................. 2