Tentative Outline of Topics

Week 1: *Need for speed*. Tiny TSP.

Week 2: *Large-scale graphs I*. Spanning trees.
   - Assignment 1: Implementation of MST algorithms.

Week 3: *Large-scale graphs II*. Perfect matchings.
   - *Computing Minimum-Weight Perfect Matchings* (Cook, Rohe).

Week 4: *Heuristic search*. TSP, graph coloring.
   - *Experimental Analysis of Heuristics for the STSP* (Johnson, McGeoch).
   - Assignment 2: Implementation of Lin-Kernighan for TSP or local-opt for colouring.

Week 5: *Geometric data*. Nearest neighbors, MST, TSP.
   - *K-d trees for semidynamic point sets* (Jon Bentley).

Week 6: *Linear and mixed-integer programming*. CPLEX, Gurobi, QSopt_ex.
   - *A Brief History of LP and MIP Computation* (Robert Bixby).
   - Assignment 3: Select final project topics.

Week 7: *Week of coding*. No lectures.
   - *The C Programming Language* (Kernighan, Ritchie).

Week 8: *Cutting planes*. TSP.

   - *A Primer in Column Generation* (Desrosiers, Lübbecke).

Week 10: *Branch and price*. Graph colouring.
   - *A Column Generation Approach for Graph Coloring* (Mehrotra, Trick).

Week 11: *Dynamic programming*. TSP, knapsack problem.
   - *DP Chapter* (Applegate, Cook, Dash, Johnson).

Week 12: *Project Presentations*. 20-minute presentations.