ICS 163 — Graph Algorithms — Winter Quarter, 1994

Class Hours: Tue/Thur 3:30AM–4:50AM, CS 253

Instructor: David Eppstein

Office: CS 448C
Phone: 856-6384
Email: eppstein@ics.uci.edu
Office hours: Mon 1:30-3:30, Thu 2:30-3:30 or by arrangement

Homework problems will be assigned Tuesdays, due in class the following Tuesday. Group work is not permitted. There will be one or two midterms and a comprehensive final exam.

Text: *Algorithmic Graph Theory*
by James A. McHugh (Prentice Hall, 1990).

Course material:

Introduction
- The bridges of Königsberg (1-7)
- Representation of graphs (1-2)
- Special kinds of graphs (1-3, 1-4, 1-6, 4-5)

Spanning trees
- Minimum spanning trees (4-3)
- Geometric minimum spanning trees (2-8, 4-4)
- Depth first search trees (ch. 5)

Path finding
- Shortest paths (ch. 3)
- Longest paths in acyclic graphs (4-5)
- Hamiltonian paths (1-8)

Connectivity, flow and matching
- Connectivity (6-1, 6-2, 6-7)
- Maximum flow (6-3, 6-4, 6-5)
- Matching (8-3)

Planar graphs
- Representation of planar graphs
- Flow in planar graphs
- Planar minimum spanning trees
- Planar graph coloring (7-4)
- Planarity testing (1-6)

NP-complete problems and approximation
- Hamiltonian paths (1-8)
- Coloring (ch. 7)
- Independent sets (8-2)