ISE 632: Network Flows and Combinatorial Optimization

University of Southern California, Spring 2018

Instructor

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Optional textbooks

- Ravindra K. Ahuja, Thomas L. Magnanti, and James B. Orlin. Network flows: theory, algorithms, and applications. Prentice Hall, 1993. Available online at https://dspace.mit.edu/bitstream/handle/1721.1/49424/networkflows00ahuj.pdf
- David Easley and Jon Kleinberg. Networks, crowds, and markets: Reasoning about a highly connected world. Cambridge University Press, 2010. Available online at http://www.cs.cornell.edu/home/kleinber/networks-book/networks-book.pdf
- Adam Kasperski. Discrete optimization and network flows. Wrocław University of Technology, 2011. Available online at http://www.ioz.pwr.wroc.pl/pracownicy/kasperski/prv/discropt.pdf.
- Bernhard Korte and Jens Vygen. Combinatorial optimization: theory and algorithms. Springer, 2008. Available online via USC Libraries.
- R. Tyrrell Rockafellar. Network flows and monotropic optimization. Wiley New York, 1984. Available online at http://www.math.washington.edu/∼rtr/papers/rtr102-NetworkFlows.pdf.

Meeting time/location

KAP 137, 9:30 - 10:50, Tuesday/Thursday

Course summary

- Graph theory
- Shortest paths
- Matching problems
- Network flow problems
- Spanning trees
- Location problems
- (Time permitting) Probability theory of combinatorial problems

Grading

Grading will be based on about 10 problem sets, a midterm exam, a final exam, and a project. The final grade averages will be computed as follows:

Problem sets	20%
Project	20%
Midterm exam	30%
Final exam	30%

Students may collaborate in groups of two or three on homework, but each student must write up their own assignments. Assignments must be neatly written with all pages stapled together.