Integer Programming

47-830

Spring 2011

Instructor: Egon Balas

Time: Tuesdays and Thursdays, 2:00-3:20

Place: Posner 147

Integer programming: scope and applicability. Formulations. Combinatorial optimization. Relaxations. Linear programs with integer solutions. Outline of solutions methods: enumeration and convexification. Complexity and problem reductions. Optimization and separation.

Branch and bound, implicit enumeration. Cutting planes. Gomory-Chvátal theory. The mixed integer Gomory cut. The problem of convergence and stalling. Disjunctive programming: optimization over unions of polyhedra. Higher dimensional representations. Disjunctive cuts. Lift-and-project.

Prerequisites: Linear programming

Text:G. Nemhauser and L. Wolsey, Integer and Combinatorial
Optimization. Wiley, 1988; paperback, 1999.

Other recommended books:

A. Schrijver, Theory of Linear and Integer Programming. Wiley, 1986.

Lawrence Wolsey, Integer Programming. Wiley, 1998.

D. Bertsimas and R. Weismantel, *Optimization Over Integers*. Dynamic Ideas, 2005.