

## Compact Course

### “Mixed-Integer Programming and Combinatorial Optimization”

February 11–15, 2013

Gerhard Reinelt, Institut für Informatik

This course gives an introduction to theory and practice of mixed-integer programming and combinatorial optimization. Besides basic mathematical knowledge and programming skills there are no further requirements to be met by the participants. The workshop will be held as a 5-day compact course in English. It specifically addresses the members of the Graduate School “Mathematical and Computational Methods for the Sciences”, but is also open to interested students in computer science and mathematics.

For an ECTS certificate of 3 credit points a 60-minute written exam has to be passed.

#### General daily schedule

- 9:15 – 10:45** Lecture 1 (INF 350, U013)
- 11:15 – 12:45** Lecture 2 (INF 350, U013)
- 14:00 – 18:00** Computer practicals (Feb 11–13 only) (INF 350, U012)

#### Preliminary lecture program

##### Monday, 11.02.2013

- 9:15 – 10:45** Introduction, Linear Programming
- 11:15 – 12:45** MIP Modelling, Combinatorial Optimization Problems

##### Tuesday, 12.02.2013

- 9:15 – 10:45** Computations of Optimum Solutions, Polyhedral Combinatorics
- 11:15 – 12:45** Relaxations, MIP Applications

##### Wednesday, 13.02.2013

- 9:15 – 10:45** Implementation of Branch-and-Cut Algorithms, MIP Preprocessing
- 11:15 – 12:45** Cutting Planes, Column Generation and Decomposition

##### Thursday, 14.02.2013

- 9:15 – 10:45** Semi-Definite Programming I (F. Rendl, U Klagenfurt)
- 11:15 – 12:45** Semi-Definite Programming II (F. Rendl, U Klagenfurt)
- 14:00 – 15:00** Written exam (OMZ U013)

##### Friday, 15.02.2013

- 9:15 – 10:45** Nonlinear Mixed-Integer Programming I (S. Sager, U Magdeburg)
- 11:15 – 12:45** Nonlinear Mixed-Integer Programming II (S. Sager, U Magdeburg)