

# “Mixed-Integer Programming and Combinatorial Optimization”

February 8–11, 2010

This course gives an introduction to theory and practice of mixed-integer programming and combinatorial optimization. It consists of lectures and talks on special applications as well as of computer practicals. 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 3 1/2 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.

Participants interested in an ECTS certificate of 3 credit points have to pass a 60-minutes written exam.

## General daily schedule

- 9:15 – 10:45** Lecture (OMZ U013)
- 10:45 – 11:15** Break
- 11:15 – 12:45** Lecture (Room OMZ U013)
- 12:45 – 14:00** Break
- 14:00 – 18:00** Computer practicals (OMZ U012, Feb 8–10))

## Monday, Feb 8, 2010

- Introduction
- Linear programming
- MIP modelling
- AMPL modeller

## Tuesday, Feb 9, 2010

- Combinatorial optimization problems
- Computations of optimum solutions
- Polyhedral combinatorics
- Relaxations
- MIP applications

## Wednesday, Feb 10, 2010

- Implementation of branch-and-cut algorithms
- MIP preprocessing
- Cutting planes
- Column generation and decomposition

## Thursday, Feb 11, 2010

- P. Wang: Satellite scheduling
- S. Wiesberg: Graph embedding
- T. Bonato: The max-cut problem
- R. Schwarz: The linear arrangement problem
- M. Oswald: The coupled task problem
- 14:00 – 15:00** Written exam (OMZ U013)