

## **Introduction to Optimization**

Centro residenziale universitario di Bertinoro, July 6-8, 2023

**Organizers and Speakers: Valentina Cacchiani e Michele Monaci**

Dipartimento di Ingegneria dell'Energia Elettrica e dell'Informazione "Guglielmo Marconi"

Università di Bologna

**Day 1 - program.** Speaker: Michele Monaci

- 09.00 – 10.30. Introduction to optimization
- 10.30 – 11.00. Break
- 11.00 – 12.30. Nonlinear optimization: optimality conditions
- 13.00 – 15.00. Lunch break
- 15.00 – 16.30. Nonlinear optimization: algorithms
- 16.30 – 17.00. Break
- 17.00 – 18.30. Lagrangian relaxation

**Day 2 - program.** Speaker: Valentina Cacchiani

- 09.00 – 10.30. Introduction to Mixed Integer Linear Programming
- 10.30 – 11.00. Break
- 11.00 – 12.30. MILP models: ideal and improved formulations
- 13.00 – 15.00. Lunch break
- 15.00 – 16.30. Dynamic Programming and Branch-and-Bound
- 16.30 – 17.00. Break
- 17.00 – 18.30. Heuristic, metaheuristic and matheuristic algorithms

**Day 3 - program.** Speaker: Valentina Cacchiani

- 09.00 – 10.30. Robust optimization
- 10.30 – 11.00. Break
- 11.00 – 12.30. Seminar: models and heuristic algorithms for real-life applications