

**Title:** An hands-on tutorial on LP and LPI modeling

**Academic Year:** 2018/2019

**Instructors:** Alice Raffaele ([alice.raffaele@univr.it](mailto:alice.raffaele@univr.it)) and Romeo Rizzi ([romeo.rizzi@univr.it](mailto:romeo.rizzi@univr.it))

**Calendar:**

First part of the course (10 hours):

- Tuesday 20/11/2018 (Meeting Room 2nd Floor, 11:30-13:30 + Laboratorio Ciberfisico, 14:30-16:30)
- Wednesday 21/11/2018 (Room M, 15:30-18:30)
- Thursday 22/11/2018 (Laboratorio Ciberfisico, 10:30-13:30)

Second part of the course (10 hours):

- Monday 10/12/2018 (Meeting Room 2nd Floor, 10:30-11:30)
- Tuesday 11/12/2018 (Meeting Room 2nd Floor, 11:30-13:30 + Laboratorio Ciberfisico, 14:30-16:30)
- Thursday 13/12/2018 (Laboratorio Ciberfisico, 10:30-12:30)
- Monday 17/12/2018 (Meeting Room 2nd Floor, 10:30-11:30)
- Tuesday 18 (Meeting Room 2nd Floor, 11:30-13:30)

**Description:**

In the first part of the mini-course we will show how to model optimization and feasibility problems as Linear Programs (LP) or Integer Linear Programs (ILP); we will use AMPL and/or GMPL to code and test them on several instances.

In the second part of the mini-course, we will focus on more complicated problems, playing with advanced features of commercial solvers such as Gurobi and GLPK. We would like to introduce methods such as cutting planes, compact formulations, column generations, and practical applications too.

**Purposes:**

We want to present important problems in the field of Operations Research and we hope to motivate students about the relevance of modeling and the development of programming skills, in order to exploit available softwares to tackle real problems.

As last year, this course can be seen as the first step in the path of mathematical modeling.

We are in contact with several companies, willing to offer internships and collaborations, and we also have some projects to propose, related to theoretical research.

**References:**

- Website of the mini-course (2017-18), <http://profs.sci.univr.it/~rrizzi/classes/modeling-intro/index.html>
- R. Fourer, D.M. Gay, B. Kernighan, "AMPL: A Modeling Language for Mathematical Programming", <http://ampl.com/resources/the-ampl-book>
- Gurobi, <http://www.gurobi.com>