INF/01 Title **

Optimization for Health Care Systems (OptHCS)

** CFU **

6 [complementary]

** Learning outcomes **

The aim of the course is to present modelling techniques and algorithmic approaches for managing health care systems in an optimal way. Specifically, we will present some relevant decision problems arising in health care, which will be formulated via suitable mathematical programming models, e.g., Linear Programming and Integer Linear Programming models. Some of these models will be implemented, tested and analyzed by means of a suitable modelling language and a general-purpose optimization solver. Moreover, algorithmic approaches will be presented, tailored to efficiently solve some of the proposed Health Care models, in an exact or heuristic way.

** Syllabus **

- Introduction to mathematical models and related algorithms (recalling Linear Programming, Integer Linear Programming, Network Flow algorithms)
- Health Care decision problems and related mathematical models:
  - Logistics problems in Health Care
  - Scheduling problems in Health Care
- Algorithmic approaches to Health Care models:
  - Exact approaches
  - Heuristic approaches
- Laboratory on mathematical modelling: modelling language and optimization solver

** Course organization & Assessment**

Lectures: 80%

Laboratory/practice: 20%

Assessment: Project + oral examination

** Prerequisites **

- Linear Programming, Integer Linear Programming, Network Flow algorithms