Name of the course: Queueing Theory and Teletraffic Engineering

Lecturer: Franco Davoli (https://rubrica.unige.it/personale/VUBOWFJq); e-mail: franco.davoli@unige.it

Duration of the course: 25 hours

Credits: 5

Language: English

Aims of the course: Queueing Theory is a fundamental tool for performance evaluation in many Engineering areas, particularly in the fields of Computer and Telecommunications Systems. The aim of the course is to provide a self-contained treatment of some basic and advanced material in these two fields, to highlight analytical modelling tools that can be used for both purposes of performance evaluation and control.

Teaching programme:

- Wrap-up of basic queueing theory (first 5 hours): Markovian queues; Little's Theorem; Markov Chains; M/G/1; Jackson Networks.
- Advanced material
    - Stochastic Knapsack and Call Admission Control
    - Fluid models: many sources asymptotics and equivalent bandwidth
    - Queueing models for batch arrivals; setup times and their relevance in dynamic adaptation for energy efficient networking
    - Some control methodologies for Markov Decision Processes over finite and infinite horizons
    - Pricing and proportional fairness

Exam modality:
Multiple answer test and/or presentation of related recent literature

Bibliography:
F. Davoli, *Lecture Notes for the Courses of Telecommunication Networks: Queueing Theory and Teletraffic*, 2nd Ed., University of Genoa, July 2021.

Timetable:
To be decided and agreed upon with interested PhD students. All those interested should contact me via email (franco.davoli@unige.it, or franco.davoli@cnit.it).