Name of the course: Energy Management Systems for Polygeneration Microgrids

Teacher: Stefano Bracco; e-mail: stefano.bracco@unige.it

Duration of the course: 12 hours

Credits: 3

Language: Italian; in the presence of foreign students, the course will be held in English.

Teaching method: Interactive lessons with the use of the computer.

Aims of the course: The course aims to provide students with the skills to develop mathematical optimization models for the operation of polygeneration microgrids and nanogrids equipped with renewable power plants, storage systems and charging infrastructure for electric vehicles.

Teaching programme:

- Microgrids and nanogrids: definitions, technologies and applications
- Basic optimization concepts
- Definition of an Energy Management System (EMS) based on a linear programming mathematical model to optimally manage a microgrid/nanogrid with power plants (e.g. photovoltaic modules, micro wind turbines, small-size cogeneration units, heat pumps), battery energy storage systems, charging points for electric vehicles, electrical and thermal loads (represented by buildings).
- Implementation of the EMS within the Matlab environment. Sensitivity analysis and discussion of results.

Exam modality:

Preparation of a written report on an EMS developed by the Student.

Bibliography:

Slides and reference scientific papers provided by the Teacher.