

Course Syllabus for
Smart and Sustainable Industry PhD Program
 (years 2024-25 /2025-26)

Course title	Microgrid structures and operation
Scientific Discipline Sector	ING-IND/33
Hours of instruction	20 hours
CFU	2 CFU
Semester	Second
Goal	The aim of the course is to describe the methodologies and procedures for planning, managing and controlling multi-energy microgrids, in AC or DC configurations, in grid-connected and islanded modes. Control and supervision of an MG is carried out by a SCADA system that, through proper Energy Management System (EMS), can optimize operation and reliability.
Syllabus	Smart grids and microgrids Planning, management and operation of microgrids in the presence of electric and thermal demand The role of microgrids in markets and enhanced grid integration through ancillary services Design, programming and control of DC microgrid for supplying electric vehicles Experiences on experimental microgrid management and operation.
Bibliography	Scientific papers and books on the selected arguments.
Examination method	A synthetic report on a chosen topic.