

Faculty	Ingegneria
Master	Mechatronic Engineering (La Spezia)
Year/Semester	1/II

Course Title	Measurement systems
ID Course Code	56916
Course Credits (CFU)	6
Scientific-Disciplinary Sector	ING-IND/12
Course Type	mono-disciplinary course
Lecturer-in-charge	CRENNA Francesco

Learning Outcomes:

Design of measuring systems, including the selection of components and architectures and the development of software for data acquisition, data processing and automatic control. Measurement of motion, forces and acoustic phenomena.

Course Organisation Details

Generic structure of a data acquisition system. Conditioning of input signals. The A/D converter as a measuring system. Microcomputers in measuring systems. Aspects of real time and embedded measurement systems (outline). Software codes for data acquisition: programming environments (LabView ®), data acquisition for process monitoring and for automatic control. Architectures. Processing of measurement signals: spectrum analysis and digital filtering (outline). Connectivity of measuring systems. Local networks. Remote control of instruments and of experiments, remote calibration. Instrumentation networks. Measurement of motion, forces and acoustic phenomena. Microsensors.

Assessment	hours
Lectures	40.0
Practice	20.0
Laboratory	0.0
Integrative activities	0.0

References

J. Park, S. Mackay, *Data acquisition for instrumentation and control system*, Elsevier, 2003
 I. Lee, J. Leung, S. Son, *Handbook of real-time and embedded systems*, Chapman & Hall/CRC, 2008
 T. T. Lang, *Computerized instrumentation*, Wiley, Chichester, 1991
 P. H. Garrett, *Computer interface engineering for real time systems*, Prentice Hall, Englewood Cliffs, 1991
 S. L. Marple, *Digital spectral analysis with applications*, Prentice Hall, New Jersey, 1988
 C. Greco, M. Rulla, L. Spagnolo *Laboratorio sperimentale di automatica*, McGraw-Hill 2003

Organization and examinations

Written admission test and oral examination, including discussion of design reports based on practice activity

Pre-requisites

None