Ph.D. program in Engineering and Applied Sciences

Ph.D. course on Instrumentation and Measurements

Prof. Giovanna Barigozzi, Prof, Valerio Re

Electronic measurement systems and analog signal processing

(Prof. Valerio Re)

1. Analog signal processing of sensor signals
2. Signal sampling: Fourier transform of a sampled signal, signal reconstruction, aliasing.
3. Fast Fourier Transform with digital oscilloscopes. Spectral leakage and windowing.
4. Electronic noise. Signal-to-noise ratio. Noise spectral density. Noise sources in electronic circuits.
5. Analog-to-digital converters. Quantization noise. Oversampling and sigma-delta converters.

Thermo-fluid dynamic measurement techniques

(Prof. Giovanna Barigozzi)

1. Measurement theory (measurement chain, errors, accuracy, uncertainty, static and dynamic characteristics).
2. Pressure measurements (static, total and dynamic pressure probes, transducers).
3. Velocity measurements (Hot wire, LDV and PIV).
4. Temperature measurements (thermocouples, thermal resistance, CW, IR thermocamera, TLC).
5. Massflow measurements.