



DIGITAL SIGNAL PROCESSING	
Anno immatricolazione	2019/2020
Anno offerta	2020/2021
Normativa	DM270
SSD	ING-INF/03 (TELECOMUNICAZIONI)
Dipartimento	DIPARTIMENTO DI INGEGNERIA INDUSTRIALE E DELL'INFORMAZIONE
Corso di studio	ELECTRONIC ENGINEERING
Curriculum	Microelectronics
Anno di corso	2°
Periodo didattico	Primo Semestre (28/09/2020 - 22/01/2021)
Crediti	6
Ore	50 ore di attività frontale
Lingua insegnamento	English
Tipo esame	ORALE
Docente	SAVAZZI PIETRO (titolare) - 6 CFU
Prerequisiti	Basic concepts in analog signal processing, spectral analysis and filtering.
Obiettivi formativi	<p>Developing a strong working knowledge on signal processing algorithms for modeling discrete-time signals, designing optimum digital filters, estimating the power spectrum of a random signal, and designing and implementing adaptive filters.</p> <p>Ability to implement the studied algorithms in Matlab standalone and hardware-oriented applications.</p>
Programma e contenuti	<p>Introduction to digital signal theory.</p> <p>Discrete time signals, sampling theorem, linear shift invariant digital systems.</p>

	<p>Analysis of digital systems in the Fourier and Z transform domains.</p> <p>Discrete-time random processes.</p> <p>Digital filtering of deterministic and stochastic signals.</p> <p>Deterministic and stochastic signal modeling.</p> <p>Wiener Filter: linear prediction, white noise filtering, unwanted signal canceling.</p> <p>Adaptive filtering: LMS, RLS and Kalman algorithms.</p> <p>Spectrum estimation.</p> <p>Application examples in Matlab and programmable hardware platforms.</p>
Metodi didattici	<p>The course is based on lectures, practical exercises, case studies, and project examples, aimed at describing applications of statistical digital signal processing to practical utility projects.</p> <p>Lectures (hours/year in lecture theatre): 44</p> <p>Practicals / Workshops (hours/year in lecture theatre): 8</p>
Testi di riferimento	<p>Monson H. Hayes Statistical Digital Signal Processing and Modeling. John Wiley & Sons Inc, 1996.</p>
Modalità verifica apprendimento	<p>The exam consists of an oral test during which questions will be asked on two/three different topics regarding the main course objectives, i.e., signal modeling, adaptive filtering, and spectrum estimation, in order to cover most of the course topics.</p> <p>Alternatively, each student can choose to implement a laboratory project, assigned by the teacher, followed by an in-depth interview. The assigned projects will cover most of the course topics.</p> <p>The final mark is in thirtieths.</p>
Altre informazioni	
Obiettivi Agenda 2030 per lo sviluppo sostenibile	<p>\$lbl_legenda_sviluppo_sostenibile</p>