IMPERIAL

Module Specification

Basic details

UID		Cohorts covered (Earliest cohort)	
Long title	Digital Signal Processing		
New code	ELEC60010	New short title	
Brief description of module *(approx. 600 chars.)*	To present the fundamental principles and applications of Digital Signal Processing.		
Available as a standalone module/ short course?	No		

Statutory details

	ECTS	CATS	Non-credit	
Credit value	5	10	N	HECOS codes
FHEQ level	6			

Allocation of study hours

	Hours	
Lectures	20	
Group teaching	0	*Incl. seminars, tutorials, problem classes.*
Lab/ practical	0	
Other scheduled	2	*Incl. project supervision, fieldwork, external visits.*
Independent study	103	*Incl. wider reading/ practice, follow-up work, completion of assess*
Placement	0	*Incl. work-based learning and study that occurs overseas.*
Total hours	125	
ECTS ratio	25.00	

Project/placement activity

Is placement activity allowed?	

Module delivery

Delivery mode	Taught/ Campus	Other	
Delivery term	1	Other	

Ownership

Primary department	Department of Electrical and Electronic Engineering
Additional teaching departments	
Delivery campus	South Kensington

Collaborative delivery

Collaborative delivery?	no

External institution	
External department	
External campus	

Associated staff

Role	CID	Given name	Surname
Module leader		Tania	Stathaki

Learning and teaching

Module description

Learning outcomes	Upon successful completion of this module, you will be able to: 1. use the sampling theory to design discrete data systems and analyse these systems in terms of systems functions and z-transform 2. analyse and design digital filters using FIR and IIR filter design techniques 3. perform and interpret correctly the results of simple short-time spectral estimation 4. learn about the FFT, the fast computation of the DFT 5. develop basic multirate signal processing systems, exploiting appropriate elements and identities, and design typical application examples including sample-rate-changing systems
Module content	Sampling theory, z-transforms, system functions; Digital filter structures, FIR/IIR filter design techniques, bilinear and band transformations; Discrete Fourier transform, relationship between DFT and DTFT, FFT; Linear convolution and circular convolution; Multirate DSP
Learning and Teaching Approach	Through lectures and exercise classes.
Assessment Strategy	You will be assessed through a closed-book examination.
Feedback	You will be provided with written comments on example exam answers.
Reading list	1.Digital Signal Processing: A Computer-Based Approach, with DSP Laboratory using MATLAB. Sanjit Mitra, McGraw Hill Education, 2001. 2. Digital signal processing: principles, algorithms and applications. J.G. Proakis, D.G. Manolakis, Pearson Prentice Hall, Pearson Education 2007.

Quality assurance

Date of first approval	
Date of last revision	
Date of this approval	

Office use only

QA Lead	
Department staff	
Date of collection	

Module leader	Tania Stathaki	Date exported	
		Date imported	
Notes/ comments			

Template version

Assessment details

Grading method	Numerical	Pass mark	40%

Assessments

Assessment type	Assessment description	Weighting	Pass mark	Must pass?
Examination	3 hour closed book written examination	100%	40%	N
		100%		