

Basic details

UID		Cohorts covered	Earliest cohort	Latest c
Long title	Digital Image Processing			
New code	ELEC70078	New short title		
Brief description of module (approx. 600 chars.)	In this module, you will examine the fundamental digital image analysis and processing concepts and analytical methods that mainly stem from a digital signal processing approach. Areas discussed include image representation and storage, filtering and transform techniques for image processing including two dimensional Fourier transforms, techniques for noise reduction, image enhancement, coding and compression techniques, and lossy versus lossless compression.			
				463 characters
Available as a standalone module/ short course?	No			

Statutory details

	ECTS	CATS	Non-credit	HECOS codes
Credit value	5	10	N	
FHEQ level	L7			

Allocation of study hours

	Hours	
Lectures	20	
Group teaching	0	<i>Incl. seminars, tutorials, problem classes.</i>
Lab/ practical	0	
Other scheduled	0	<i>Incl. project supervision, fieldwork, external visits.</i>
Independent study	105	<i>Incl. wider reading/ practice, follow-up work, completion of assessments</i>
Placement	0	<i>Incl. work-based learning and study that occurs overseas.</i>
Total hours	125	
ECTS ratio	25.00	

Project/placement activity

Is placement activity allowed?	No
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Module delivery

Delivery mode	Taught/ Campus	Other	
Delivery term	Autumn	Other	

Ownership

Primary department	Department of Electrical and Electronic Engineering
Additional teaching departments	0
Delivery campus	South Kensington

Collaborative delivery

Collaborative delivery?

External institution
External department
External campus

Associated staff

Role	CID	Given name	Surname
Module Leader		Tania	Stathaki
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Learning and teaching

Module description

Learning outcomes	On successful completion of this module, you should be able to: 1. use analytical methods in digital image processing. 2. apply, evaluate and compare various Image Transform models. 3. apply, evaluate and compare various Image Enhancement and Image Restoration techniques. 4. implement different Image Compression techniques. 5. apply the techniques taught in the course to real-life scenarios, interpret the results obtained and propose solutions for further improvements.
Module content	Image Transforms: Definition and Properties of 2-D Unitary Transforms. Singular Value Decomposition. Fourier Transform. Discrete Cosine Transform. Walsh Transform. Hadamard Transform. Karhunen-Loeve Transform. Image Enhancement: Histogram manipulation, noise reduction, Principal Component Analysis; Image Restoration: Geometric registration. Inverse filtering. Wiener Filtering. Direct Matrix inversion. Non-linear restoration-Simulated annealing. Edge detection and image thresholding. Texture analysis. Wavelets.
Learning and Teaching Approach	The module is taught in the form of lectures. Textbook, notes written by the teacher and problem sheets are provided. You will not be assessed for problem solving and you will be encouraged to solve and thoroughly understand all the problems provided.
Assessment Strategy	The module is assessed by exam only. This takes place after the Easter break. The exam duration is 3 hours.
Feedback	There isn't any formal feedback before the exam. You are encouraged to contact the lecturer if you have questions regarding the material taught and the problem sheets provided.
Reading list	Core: Gonzalez, R.C., & Woods, R.: Digital Image Processing, Pearson, 2008.

Quality assurance

Office use only

Date of first approval
Date of last revision

QA Lead
Department staff

Date of this approval

Date of collection

Module leader

Dr Tania Stathaki

Date exported

Date imported

Notes/ comments

Template version #####

Assessment details

Grading method	Numerical
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Pass mark

50%

Assessments

[illegible]

100%