

Basic details

UID		Cohorts covered	Earliest cohort	Latest c
Long title	Probability and Stochastic Processes			
New code	ELEC70048	New short title		
Brief description of module (approx. 600 chars.)	This module provides analytical tools for studying random phenomena appearing in engineering systems. In this module, you will learn the foundation of probability theory, you will study randomly-varying functions of time, known as stochastic processes or random processes. You will learn to use probabilistic models to analyse and evaluate complex engineering systems.			
				369 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	10	<i>Incl. seminars, tutorials, problem classes.</i>
Lab/ practical	0	
Other scheduled	0	<i>Incl. project supervision, fieldwork, external visits.</i>
Independent study	95	<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?	0
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Module delivery

Delivery mode	Taught/ Campus	Other	
Delivery term	Term 1	Other	

Ownership

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

Collaborative delivery

Collaborative delivery?

No

External institution
External department
External campus

Associated staff

Role	CID	Given name	Surname
Module Leader		Cong	Ling
		0	0
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Learning and teaching

Module description

Learning outcomes	By the end of this module you will be able to (1) evaluate the performance of a system using key concepts of probability and random variables, (2) derive the probability density function of a function of a random variable or random variables, (3) model an engineering problem using random signals ('stochastic processes') and Markov chains, (4) analyse random phenomena (signals and noise) in electrical engineering
Module content	Random variables; Functions of a random variable; Two random variables; Sequences of random variables; Parameter estimation; Stochastic processes; Power spectrum; Minimum mean-square estimation; Markov chains; Poisson processes and martingales.
Learning and Teaching Approach	The module will be delivered primarily through large-class lectures introducing the key concepts and methods, supported by a variety of delivery methods combining the traditional and the technological. The content is presented via a combination of slides, whiteboard and visualizer. Learning will be reinforced through non-assessed problem sheets.
Assessment Strategy	This module presents opportunities for both formative and summative assessment. You will be formatively assessed through practical sessions. You will have additional opportunities to self-assess your learning via coursework. You will be summatively assessed by a written closed-book examination at the end of the module.
Feedback	Formative feedback is provided in an on-going basis as you are welcome to ask for in person clarifications during class or afterwards. You will receive feedback on examinations in the form of an examination feedback report on the performance of the entire cohort. You will receive individual feedback on the coursework in the form of a written report. You will receive feedback on your performance whilst undertaking practical exercises, during which you will also receive instruction on the correct solution to the problems.
Reading list	Core [1] A. Papoulis and S. U. Pillai, Probability, random variables, and stochastic

processes / Athanasios Papoulis, S. Unnikrishna Pillai., 4th ed., international ed. Boston :: McGraw-Hill, p. x, 852 s. : Supplementary [1 A. Leon-Garcia and A. Leon-Garcia, Probability, statistics, and random processes for electrical engineering /, 3rd ed. Upper Saddle River, N.J. :: Pearson/Prentice Hall/Pearson Education international. [2 G. Grimmett and D. Stirzaker, Probability and random processes /, 3rd ed. Oxford :: Oxford University Press, 2001. [3 H. Stark and A. Kumar, Probability, statistics, and random processes for engineers, 4th ed. International edition. Harlow :: Harlow : Pearson Education, 2012.

Quality assurance

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

Module leader

Notes/ comments

Office use only

QA Lead
Department staff
Date of collection

Date exported
Date imported

Assessment details

Grading method	Numerical
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Pass mark

50%

Assessments

[illegible]

100%