IMPERIAL

Module Specification

Basic details

			Earliest cohort	Latest c
UID		Cohorts covered		

Long title: Discrete-Event Systems

New code:

New short title:

Brief description of module *(approx. 600 chars.)*: The module introduces the basic techniques involved in the modeling, analysis and supervisory control of discrete event systems. Both logic models (such as Automata) and timed models (such as Markov chains) will be looked at in a deterministic and non-deterministic set-up.

273 characters

Available as a standalone module/ short course? No

Statutory details

	ECTS	CATS	Non-credit
Credit value	5	10	N

FHEQ level: L7

HECOS codes:

Allocation of study hours

	Hours	
Lectures	20	
Group teaching	0	*Incl. seminars, tutorials, problem classes.*
Lab/ practical	0	
Other scheduled	0	*Incl. project supervision, fieldwork, external visits.*
Independent study	105	*Incl. wider reading/ practice, follow-up work, completion of assessments*
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? 0

Module delivery

Delivery mode	Taught/ Campus	Other	
Delivery term		Other	

Ownership

Primary department: Department of Electrical and Electronic Engineering

Additional teaching departments: 0

Delivery campus: South Kensington

Collaborative delivery

Collaborative delivery?	0

External institution	
External department	
External campus	

Associated staff

Role	CID	Given name	Surname
Module Leader		David	Angeli
		0	0
		0	0
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		0	0

Learning and teaching

Module description

Learning outcomes	On successfully completing this module you shall be able to: 1. Assess the the suitabillity of a system for modeling in a discrete-event set-up; 2. Create a discrete-event model and assess its structural properties; 3. Design algorithms for the qualitative and quantitative analysis of Discrete Event Systems; 4. Design a supervisory controller and an observer automaton; 5. Simulate a discrete event system; 6. Assess the performance of the system in a deterministic and stochastic set-up.
Module content	Finite state Automata: deterministic and non-deterministic; Supervisory Control; Petri Nets; Timed Automata: stochastic and deterministic; Markov Chains.
Learning and Teaching Approach	This module is taught through lectures. Owing to the interdisciplinary nature of the subject, a substantial amount of new concepts will be introduced. Classes will illustrate new tools by means of examples and detailing proofs of key results to add insight. Alongside lectures you will do one coursework to further your understanding of Nondeterministic Automata and Observer design.
Assessment Strategy	The module is assessed by a 3-hour, open book, written examination and through a coursework. The coursework deals with an observer design for the navigation of autonomous robots in unknown maps.
Feedback	Summative feedback will be provided through comments on the coursework after submission. Moreover formative feedback is provided in an on-going basis by answering questions and in person clarifications both during class and office hours.
Reading list	Cassandras, C.G. & Lafortune, Sl: Introduction to Discrete Event Systems, Springer, 2nd ed

Quality assurance

Date of first approval

Office use only

QA Lead

Date of last revision		Department staff	
Date of this approval		Date of collection	
		Date exported	
Module leader	David Angeli	Date imported	
Notes/ comments			

Template version #####

Assessment details

			Pass mark
Grading method	Numerical		50%

Assessments

Assessment type	Assessment description	Weighting	Pass mark	Must pass?
Examination	3 hour open book written examination	75%	50%	N
Coursework	Coursework: Develop code in Matlab to model and analyse discrete event systems	25%	50%	N
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
0	0	0%	0%	0.00
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