COURSE SPECIFICATION FORM

for new course proposals and course amendments

Department/School:	**Mathematics**	**Academic Session:**	**2015-16**
Course Title:	Applied Probability	**Course Value:** (UG courses = unit value, PG courses = notional learning hours)	0.5 unit
Course Code:	MT4360	**Course JACS Code:** (Please contact Data Management for advice)	G100
Availability: (Please state which teaching terms)	Term 2	**Status:**	Optional Condonable
Pre-requisites:	MT2320	**Co-requisites:**	-
Co-ordinator:	-		
Course Staff:	-		
Aims:	To introduce the student to a range of examples of probabilistic methods used to model systems that exhibit random behaviour.		
Learning Outcomes:	1. understand the structure and concepts of discrete and continuous time Markov chains with countable state space; 2. use the method of conditioning and the method of conditional expectation; 3. use the method of generating functions; 4. construct a probability model for a variety of problems. 5. demonstrate a breadth of understanding appropriate for an M-level course.		
Course Content:	Preliminaries: Conditional expectation; generating functions; Distribution of random sums; Stochastic processes - basic Notions. Poisson Process: Interarrival and waiting times; Conditional distribution of the waiting times; Nonhomogeneous processes; Compound Poisson process. Renewal theory: Renewal processes; Some limit theorems; Alternating renewal processes; Delayed renewal processes; Cumulative renewal processes. Markov processes: Markov chains, classification of states, Some limit theorems; Stationary distributions; Absorption probabilities.		
Teaching & Learning Methods:	The total number of notional learning hours associated with this course are 150. 3 hours of lectures a week over 11 weeks. Total 33 hours. 117 hours of private study, including work on problem sheets and examination preparation. This may include discussions with the course leader if the student wishes.		
Key Bibliography:	Probability and Random Processes – G R Grimmett and D R Stirzaker (Oxford UP 1992). Library Ref. 518.1 GRI Stochastic Processes S M Ross (Wiley 1996). Library Ref. 519.2 Introduction to Stochastic Modeling – H M Taylor and S Karlin (Academic Press 1998). Library Ref. 518.2 TAY Introduction to Probability Models – S M Ross (Academic Press 2003). Library Ref. 518.1 ROS		
Formative Assessment & Feedback:	Formative assignments in the form of 8 problem sheets. The students will receive feedback as written comments on their attempts.		
Summative Assessment:	**Exam:** 100% Written exam. A two hour paper. **Coursework:** None		

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