COURSE SPECIFICATION FORM

for new course proposals and course amendments

DEPARTMENT OF MATHEMATICS				**Academic Session: 2017-18**	
Course Code:	MT3360	**Course Value:**	0.5	**Status:** *(ie:Core, or Optional)*	Optional
Course Title:	Applied Probability			**Availability:** *(state which teaching terms)*	Term 2
Prerequisites:	MT2320			**Recommended:**	MT1300
Co-ordinator:					
Course Staff:	Dr A. A. Koloydenko				
Aims:	To introduce the student to a range of examples of probabilistic methods used to model systems that exhibit random behaviour.				
Learning Outcomes:	On completion of the course the student should be able to: • understand the structure and concepts of discrete and continuous time Markov chain with countable state space; • use the method of conditioning and the method of conditional expectation; • use the method of generating functions; • construct a probability model for a variety of problems.				
Course Content:	**Preliminaries:** Conditional expectation; generating functions; Distribution of random sums; Stochastic perocesses - 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:	33 hours of lectures and examples classes. 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:	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. on order* Introduction to Probability Models – S M Ross (Academic Press 2003). *Library Ref. on order* Probability and Random Processes – G R Grimmett and D R Stirzaker (Oxford UP 1992). *Library Ref. 518.1 GRI*				
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** (%) A two-hour paper: 100% **Coursework** None				

Updated September 2017