COURSE SPECIFICATION FORM

for new course proposals and course amendments

DEPARTMENT OF MATHEMATICS				**Academic Session: 2020-21**	
Course Code:	MT5436	**Course Value:**	200 h	**Status:** *(ie:Core, or Optional)*	Optional
Course Title:	Markov Chains and Applications			**Availability:** *(state which teaching terms)*	Term 2
Prerequisites:				**Recommended:**	
Co-ordinator:					
Course Staff:					
Learning Objectives:	This module will introduce the student to a range of probabilistic methods used to model systems that exhibit random behaviour.				
Learning Outcomes:	On completion of the module the student should be able to: understand the structure and concepts of discrete and continuous time Markov chains with countable state space; construct a probability model for a variety of problems; understand the basic theory behind Bayesian inference; be able to formulate statistical problems such as regression in terms of a Bayesian model; understand the concept of Gibbs sampling; understand the structure of diffusion processes; understand the concept of Brownian motion. The student will also demonstrate a breadth of understanding appropriate for an M-level course.				
Teaching & Learning Methods:	40 hours of lectures. 160 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 assessment in the form of 8 problem sheets. The students will receive feedback as written comments on their attempts.				
Summative Assessment:	**Exam** (%) A two-hour written exam: 85% **Coursework** (%)Set exercises: 15%				