COURSE SPECIFICATION FORM

DEPARTMENT OF: Mathematics				**Academic Session: 2020-21**	
Course Code:	MT5445	**Course Value:**	200 h	**Status:** *(ie:Core, or Optional)*	Optional
Course Title:	Quantum Information Theory			**Availability:** *(state which teaching terms)*	Term 2
Prerequisites:	Undergraduate courses in probability and linear algebra			**Recommended:**	
Co-ordinator:					
Course Staff					
Learning Objectives:	In this module you will develop an understanding of how the behaviour of quantum systems can be harnessed to perform information processing tasks that are otherwise difficult, or impossible, to carry out.				
Learning Outcomes:	On completion of the module, the student should be able understand phenomena such as quantum entanglement and the no-cloning principle, and how these can be used to perform, for example, quantum key distribution. The student should also have an understanding of a number of basic quantum computing algorithms, observing how they outperform their classical counterparts when run on a quantum computer. The student should be able to demonstrate a breadth of understanding appropriate for an M-level course and demonstrate independent learning skills.				
Teaching & Learning Methods:	30 hours of lectures. 170 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:	M.A. Nielsen and I.L. Chuang – Quantum Computation and Quantum Information (Cambridge 2000). *Library Ref. 001.64 NIE*				
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: 75% **Coursework** (%) Miniproject: 10% Set exercises: 15%				

Updated December 2019