COURSE SPECIFICATION FORM
for new course proposals and course amendments

Department/School:	**Mathematics**	**Academic Session:**	**2020-21**
Course Title:	Principles of Algorithm Design	**Course Value:** (UG courses = unit value, PG courses = notional learning hours)	200 h
Course Code:	MT5414	**Course JACS Code:** (Please contact Data Management for advice)	G100
Availability: (Please state which teaching terms)	Term 1	**Status:**	Optional Condonable
Pre-requisites:	An undergraduate course in discrete mathematics	**Co-requisites:**	-
Co-ordinator:	-		
Course Staff:	-		
Learning Objectives:	The development of efficient algorithms is essential when considering problems with large inputs. Usually, an algorithm has certain specifications, for example that it should solve a problem and take at most $f(n)$ steps on any input of size n. This module is about the design of efficient algorithms and proving that they meet the desired specification. The module introduces basic principles and methods of algorithm design and analysis and considers fundamental problems like sorting numbers and multiplying matrices.		
Learning Outcomes:	By the end of the module, a student should understand and be able to apply the fundamental principles of algorithm design; be able to analyse basic algorithms; know basic data-structures; know asymptotic notation; and know a selection of efficient algorithms. 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 lecturer if the student wishes.		
Key Bibliography:	Introduction to Algorithms by Cormen, Leiserson, Rivest, and Stein Probability and Computing: Randomized Algorithms and Probabilistic Analysis by Mitzenmacher and Upfal.		
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 written exam: 75%. **Coursework:** Miniproject: 10% Set exercises: 15%.		

Updated December 2019