COURSE SPECIFICATION FORM

for new course proposals and course amendments

Department/School:	**Mathematics**	**Academic Session:**	**2020-21**
Course Title:	Topology	**Course Value:** (UG courses = unit value, PG courses = notional learning hours)	200 h
Course Code:	MT5491	**Course JACS Code:** (Please contact Data Management for advice)	G100
Availability: (Please state which teaching terms)	Term 2	**Status:**	Optional Condonable
Pre-requisites:	Undergraduate real analysis	**Co-requisites:**	-
Co-ordinator:			
Course Staff:	-		
Learning Objectives:	This module introduces the ideas of metric and topological spaces, and introduces some aspects of low-dimensional topology. A metric space is a set together with a notion of distance between each pair of its points. Examples include the usual distance in *n*-dimensional space, and the distance between functions approximating a given function. Concepts from real analysis such as continuity depend upon a notion of “closeness", and so metric spaces generalise to multidimensional spaces the concepts of continuity and other ideas studied in real analysis. Topological spaces are a powerful generalisation of metric spaces, and have had a profound influence in the development of mathematics. This module will introduce many examples of metric spaces and topological spaces, and fundamental ideas within topology will be discussed, including separation axioms, compactness and connectedness. The module will also illustrate how the ideas of topological spaces give rise to other branches of topology, such as low-dimensional topology.		
Learning Outcomes:	By the end of the module, a student should understand the defining properties of a metric space, and determine whether a given function defines a metric; understand some basic concepts of metric spaces; understand the definition of a topological space, and be able to verify the axioms in examples; understand fundamental concepts of topological spaces such as subspaces, product spaces, quotient spaces, Hausdorff space, homeomorphism, connectedness and compactness; understand some concepts from low-dimensional topology such as the classification of surfaces. 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. Armstrong, Basic topology. Undergraduate Texts in Mathematics. Springer-Verlag, 1983. S. E. Goodman, Beginning Topology, American Mathematical Society, 2009. J. A. Munkres, Topology, second edition, Pearson, 1999. W. A. Sutherland, Introduction to metric and topological spaces. Second edition Oxford University Press, 2009.		
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%.		