PROFORMA FOR NEW COURSE

1.	Title of the Course	Spatio-Temporal Modelling
2.	Course Number	MA6032
3.	Status of the Course	Elective
4.	Structure of Credits	3-0-0-3
5.	Offered To	PG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Mathematics and Statistics
8.	To take effect from	July 2020
9.	Prerequisite	CoT
10.	Whether approved by the Department	Yes
11.	**Course Objective:** To characterize and build tools for spatio-temporal processes. To unravel the functionality of environmental, epidemiological models via statistical mechanism.	
12.	**Course Content:** Statistical preliminaries: conditional probabilities, hierarchical modelling, inference and diagnostics, posterior distribution, graphical representation of statistical dependencies; Spatial random processes: geostatistical, lattice, spatial point processes, and random sets; Spectral analysis of spatio-temporal data, empirical orthogonal functions, principal oscillation pattern, spatio-temporal canonical correlation, covariance function, and kriging, spatio-temporal statistical models, hierarchical dynamical spatio-temporal models.	
13.	**Text book(s):** 1. Cressie N and Wikle C K, *Statistics for Spatio Temporal Data*, 1st Edition, Wiley (2011). 2. Hristopulos D T, *Random Fields for Spatial Data Modeling*, 1st Edition, Springer (2020).	
14.	**Reference(s):** 1. Cressie N, *Statistics for Spatial Data*, 1st Edition, Wiley (1993). 2. Diggle P J, *Statistical Analysis of Spatial and Spatio-Temporal Point Patterns*, 3rd Edition, CRC Press (2014). 3. Finkenstad B, Held L and Isham V, *Statistical Methods for Spatio-Temporal Systems*, 1st Edition, Chapman & Hall/CRC (2007) 4. Wikle C K, Mangion A Z, Cressie N and Isham V, *Spatio-Temporal Statistics with R*, 1st Edition, CRC Press (2019)	