

1.	Title of the course	Ergodic Theory
2.	Course number	MA631L
3.	Structure of credits (L-T-P-C)	3-0-0-3
4.	New course/modification to	New
5.	To be offered by	Mathematics and Statistics
6.	Prerequisite	CoT
7.	Course Objective(s): To discuss the theory of dynamical systems in the set-up of probability measure preserving transformations. To discuss a few ergodic theorems and their applications. To characterize ergodic properties using spectral theory.	
8.	Course Content: Statistical Properties: ergodicity, weak mixing, mixing; Measure preserving transformations: translations of torus, angle doubling map, Bernoulli schemes, finite Markov chains, geodesic flow, horocycle flow; Constructions in ergodic theory: skew products, factors, natural extension, induced transformations, suspensions, Kakutani skyscrapers; Von Neumann ergodic theorem; Birkhoff's ergodic theorem; Koopman operators and spectral characterization of ergodic properties.	
9.	Textbook(s): 1. Halmos P R, Lectures on Ergodic Theory, Dover (2013).	
10.	Reference(s): 1. Katok A and Hasselblat B, Introduction to the Modern Theory of Dynamical Systems, Cambridge (1995). 2. Cornfeld I P, Fomin S V and Sinai Ya G, Ergodic Theory, Springer (1982). 3. Walters P, An Introduction to Ergodic Theory, Springer (2000). 4. Petersen K, Ergodic Theory, Cambridge (1983).	