Semester	JAN 2022
Open to semester	6,8,12
Course code	**MT3244**
Course title	**Calculus on Manifolds**
Credits	4 /
Course Coordinator & participating faculty (if any)	Vivek Mohan Mallick
Nature of Course	Lectures and Tutorials
Pre-requisites	Real Analysis II, Point Set Topology
Objectives (goals, type of students for whom useful, outcome etc)	In calculus we found that many important phenomena in the geometry of R, R^2, R^3, occur “locally”, that is in small neighborhoods of points. But there are other topological spaces, such as the circle, the sphere, etc. which locally “look like” R, R^2,... These are manifolds, and on such objects one may generalize familiar concepts from multivariable calculus. This course will lead students through these ideas. This course is particularly important for students of geometry and theoretical physics.
Course contents (details of topics /sections with no. of lectures for each)	Curves and surfaces in R^2 and R^3: Geometry of Gauss maps, Intrinsic geometry of surfaces, Theorema egregium, Gauss Bonnet Theorem, manifolds in R^n, Smooth functions on manifolds, Tangent space, Inverse / Implicit function theorems, Sards’ theorem, Regular value theorem, Smooth partition of unity, Integration of scalar functions on manifolds
Evaluation /assessment	End-Sem Examination-50% Mid-Sem Examination-40% Others-10%
Suggested readings (with full list of authors, publisher, year, edn etc.)	1. Calculus on Manifolds: M. Spivak (1998) Westview Press 2. Analysis on Manifolds: J. R. Munkres (1991) Westview Press 3. Topology From the Differentiable Viewpoint: J. Milnor

	(1997) Princeton University Press 4. Differential Geometry of Curves and Surfaces: Manfredo P. do. Carmo (1976) Prentice Hall 5. Elementary Differential Geometry, A.N. Pressley, Springer UM 2010