

Subject Code: 1SC2040405	Subject Title: Differential Manifolds
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Course Objective:

- This is an introductory course in Differential Manifold which provide a working knowledge of the basic definitions and theorems of the Differential calculus in Banach spaces, Tangent spaces to a manifold described in detail in the syllabus.

Teaching scheme (hours) per week		credit		Theory Marks		Practical Marks		Total
Theory	Tutorial	Theory	Tutorial	University Assessment	Cont. Assessment	University Assessment	Cont. Assessment	
4	1	4	1	60	40	-	-	

Subject Contents				
Unit. No	Topic	Total Hours	Weight (%)	
1	Differential calculus in Banach spaces, chain rule, derivatives of multilinear Maps.	18	25	
2	Derivatives of determinant, directional derivatives, derivatives in matrix spaces.	18	25	
3	Higher derivatives, Taylor's theorem, smooth functions with compact supports in $\mathbb{R}^n$. Differential manifolds, examples, smooth maps, diffeomorphisms	18	25	
4	Tangent spaces to a manifold, basis theorem, level surfaces as manifolds, tangent spaces of level surfaces.	18	25	

Course Outcome:

On successful completion of the course, students should be able to

- Students should be able to apply the conceptual structure of Differential calculus in Banach spaces, Differential manifolds and basis theorem.

List of References:

- S. Kumaresan, A course on Differential Geometry and Lie Groups, TRIM 22, Hindustan Book Agency, 2002.
- F. Warner, Foundation of Differentiable Manifolds and Lie Groups, Springer-Verlag, 1984.
- M. Spiwak, A Comprehensive Introduction to Differential Geometry, Published or Perish, 1970