Information of the graduate level course on **Analysis on Manifolds (MAD038P6E)** at IIT Jammu, India

Course contents:

- Differentiation on $\mathbb{R}^n$: Limits, continuity and differentiability for functions of several real variables. Inverse and Implicit function theorems and their applications. Plane and space curves.
- Riemann integration in $\mathbb{R}^n$: Multiple integrals, Fubini's theorem for change of order in multiple integrations, rectifiable sets, partition of unity and change of variable formula and applications.
- Manifolds: Definitions and examples, tangent and normal spaces to manifolds in $\mathbb{R}^n$, differentiability and integrability for functions defined on smooth submanifolds in $\mathbb{R}^n$. Surface area and volume of submanifolds in $\mathbb{R}^n$.
- Differential forms and their integrations. Green's, Gauss's and Stoke's theorems and their applications.

Class and tutorial timings for the course:

- Monday, 4:00 PM to 6:00 PM
- Wednesday, 11:00 AM to 1:00 PM (Tutorial)
- Friday, 4:00 PM to 6:00 PM

Credit system for the course:

- 10 marks for homework assignments.
- 20 marks for class tests. There will be two class tests.
- 30 marks for mid-sem exam.
- 40 marks for end-Sem exam.

References for the course:

1. M. Spivak, Calculus on Manifolds, CRC Press A Chapman & Hall Book, 1965.
2. J. R. Munkres, Analysis on Manifolds, CRC Press A Chapman & Hall Book, reprint-2018.

3. C. Bar, Elementary Differential Geometry, Cambridge University Press, 2017.

4. S. Kumaresan, A course in differential geometry and Lie Groups, Hindustan Book Agency, 2002.

5. G.B. Folland, Advanced calculus, Pearson Education, 2012.