

MA3402 Analysis on Manifolds

Lecture Number	Lecture Name	Aims and Objectives	Activities, Material, Refs
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Topic I: Manifolds

1.	Calculus Review	Aim: To recall the key concepts of calculus. Objectives: By the end of this lecture a student should be able to: 1. List the main definitions and results of calculus 2. Understand the key role of approximation in the application of analysis	1. Recall quiz 2. Vote for the “Most Valuable Theorem” 3. How close is close enough?
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Excursion A: Lie Groups

2.	Lie Groups	Aim: To introduce basic Lie groups Objectives: By the end of this lecture a student should be able to: 1. Prove that multiplication and inverse are smooth maps on Gl_n. 2. Prove the same for O_n. 3. Know the definition of a principal bundle (for Gl_n and O_n). 4. Know how to construct associated fibre bundles.	
3.	Problem Session	Aim: To go through the fifth problem sheet. Objectives:	Fifth problem sheet

Topic II: Differentiation

4.	Differentiation on Manifolds	Aim: To explore the different types of differentiation that are possible. Objectives: By the end of this lecture a student should be able to: 1. Define the Lie bracket of vector fields in terms of flow. 2. Define the Lie derivative of tensors.	1. Differentiation as change under infinitesimal perturbation.
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Mon 23	Lecture 1: Calculus Review
Tue 24	Lecture 2: Lie Groups
Wed 25	
Thu 26	
Fri 27	
Sat 28	
Sun 29	
Mon 30	Lecture 3: Problem Session
Tue 31	Lecture 4: Differentiation on Manifolds

September

Wed 1	
Thu 2	
Fri 3	
Sat 4	
Sun 5	
Mon 6	Lecture 5:
Tue 7	Lecture 6:
Wed 8	
Thu 9	
Fri 10	
Sat 11	
Sun 12	
Mon 13	Lecture 7:
Tue 14	Lecture 8:
Wed 15	
Thu 16	
Fri 17	
Sat 18	
Sun 19	
Mon 20	Lecture 9:
Tue 21	Lecture 10:
Wed 22	
Thu 23	
Fri 24	
Sat 25	
Sun 26	
Mon 27	Lecture 11:
Tue 28	Lecture 12:
Wed 29	
Thu 30	