1.	Title of the course	Lie Algebras
2.	Course number	MA620L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To MA6037/12
6.	To be offered by	Department of Mathematics and Statistics
7.	To take effect from	July 2022
8.	Prerequisite	CoT
9.	**Course Objective(s):** To introduce the notions of abstract Lie algebras and their representations. To discuss structure theorems for complex solvable and nilpotent Lie algebras. To classify complex semisimple Lie algebras via root systems.	
10.	**Course Content:** Definition and examples of Lie algebras, subalgebras, ideals, homomorphisms, quotient algebras, solvable and nilpotent Lie algebras, Engel's theorem, Lie's theorem, Jordan-Chevalley decomposition, Cartan's criterion for solvability, Killing form, Weyl's complete reducibility theorem, preservation of Jordan decomposition, representations of sl(2, C), root space decomposition of semisimple Lie algebras, root systems, bases, Weyl chambers, Weyl group, Cartan matrices, Dynkin diagrams, classification of root systems.	
11.	**Textbook(s):** 1. Erdmann K and Wildon M J, *Introduction to Lie Algebras*, 1st Edition, Springer (2006). 2. Humphreys J, *Introduction to Lie Algebras and Representation Theory*, 1st Edition, Springer (1972).	
12.	**Reference(s):** 1. Bourbaki N, *Lie Groups and Lie Algebras*, 1st Edition, Springer (2002). 2. Carter R, *Lie Algebras of Finite and Affine Type*, 1st Edition, Cambridge University Press (2005). 3. Fulton W and Harris J, *Representation Theory*, 1st Edition, Springer (2004). 4. Serre J P, *Complex Semisimple Lie Algebras*, 1st Edition, Springer (2001).	