

MADHAVA LECTURE SERIES MLS02 GROUP THEORY

SPEAKERS - ABHISHEK RAJAN, PURNIMA TIWARI, ARPIT TRIVEDI, AAYUSH VERMA, KRISHNAKANT YADAV

DATES - 10 JAN'25 - TBA
VENUE - MATHEMATICS LAB, SBS

THEORETICAL NEXUS

<https://sites.google.com/view/theoreticalnexus/lecture-series/mls/mls02-group-theory>

This will be a winter tutorial lecture series in the Madhava Lecture Series (MLS). The motivation behind this lecture series is to discuss and communicate on different topics in Group Theory and Algebra. The focus will be majorly on the group theory. The idea is to create a series that contains the subject in a rigorous manner as well as their preliminaries.

COURSE DESCRIPTION

A student in modern algebra is likely to first encounter the subject of group theory before the rings, fields, and modules theory. The idea of a group was put forth by Évariste Galois to discuss the solutions of polynomials of degree higher than four. Group is a very important mathematical object not only of algebra, but also of geometry, graphs, and number theory.

Study on groups have been done by many mathematicians from Galois to Cayley to Lie to Chevalley to Grothendieck. It is evident in the system that a mathematician, a young one, must understand and appreciate the concept of a group (or similar algebraic objects).

Roughly, the series aims to build upon the basics of the groups (including the preliminaries like sets and maps) and then carefully step into a more rigorous and intuitive topics in group theory like permutations in a group, isomorphisms and automorphisms theorems, solvability, representation of a group, class groups, group actions, the Sylow's theorems, and so on. But we do not intend to limit ourselves to the selected syllabus.

Note to attendants: You are suggested to keep checking the <https://sites.google.com/view/theoreticalnexus/lecture-series/mls/mls02-group-theory> for updated syllabus and schedule. No registration is required; you can just join us at the given venue and the lectures will also be recorded and uploaded on our youtube.

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We also hope to encourage and invite the participants to dwelve into the discussions that may not fit to group theory but still be relevant like rings, algebraic number theory, category theory and Galois theory.

TENTATIVE SCHEDULE

For the up-to-date schedule, please keep checking the series webpage. We will send more suggested readings (decided by individual speakers) with our each email announcement.

- Lecture 1: **TBA** by **Krishnakant Yadav** (10 Jan 2025, Fri)
- Lecture 2: **TBA** by **Krishnakant Yadav** (13 Jan 2025, Mon)
- Discussion Session 1 (15 Jan 2025, Wed)
- Lecture 3: **TBA** by **Abhishek Rajan** (17 Jan 2025, Fri)
- Lecture 4: **TBA** by **Abhishek Rajan** (20 Jan 2025, Mon)
- Discussion Session 2 (22 Jan, 2025, Wed)
- Lecture 5: **TBA** by **Arpit Trivedi** (27 Jan 2025, Mon)
- Lecture 6: **TBA** by **Arpit Trivedi** (29 Jan 2025, Wed)
- Discussion Session 3 (31 Jan 2025, Fri)
- Lecture 7: **TBA** by **Arpit Trivedi** (03 Feb 2025, Mon)
- Lecture 8: **TBA** by **Purnima Tiwari** (TBA)
- Discussion Session 4 (TBA)
- Lecture 9: **TBA** by **Purnima Tiwari** (TBA)
- Lecture 10: **TBA** by **Purnima Tiwari** (TBA)
- Discussion Session 5 (TBA)
- Lecture 11: **TBA** by **NA** (TBA)
- Lecture 12: **TBA** by **NA** (TBA)
- Discussion Session 6 (TBA)
- Lecture 13: **TBA** by **NA** (TBA)
- Lecture 14: **TBA** by **NA** (TBA)
- Discussion Session 7 (TBA)
- Lecture 15: **TBA** by **Aayush Verma** (TBA)
- Lecture 16: **TBA** by **Aayush Verma** (TBA)
- Discussion Session 8 (TBA)

SUGGESTED READINGS AND REFERENCES

- Abstract Algebra by Dummit and Foote
- <https://kconrad.math.uconn.edu/blurbs/>
- Algebra by Artin
- Algebra by Bourbaki
- Commutative Algebra by Atiyah and Macdonald
- Contemporary Abstract Algebra by Joseph A. Gallian
- Topics in Algebra by I. N. Herstein