

MATH-429

Representation Theory II - Lie groups and algebras

Negut Andrei

Cursus	Sem.	Type
Ing.-math	MA2, MA4	Opt.
Mathématicien	MA2	Opt.

Language of teaching	English
Credits	5
Session	Summer
Semester	Spring
Exam	Written
Workload	150h
Weeks	14
Hours	4 weekly
Lecture	2 weekly
Exercises	2 weekly
Number of positions	

Summary

This is a standard course on Lie groups, Lie algebras and their representations.

Content

This is a second semester course in representation theory. We will study Lie groups and Lie algebras, with particular emphasis on algebraic aspects, and with the guiding examples of the classical groups in mind. We will also classify representations of Lie groups and Lie algebras, and discuss their character theory.

Keywords

Lie groups, Lie algebras, classical groups, representations, character formulas

Learning Prerequisites**Required courses**

MATH-211 Group theory

MATH-314 Representation theory I - finite groups

Recommended courses

MATH-213 Differential geometry

Learning Outcomes

By the end of the course, the student must be able to:

- Formulate the main concepts and theorems defined in the course
- Theorize the role of Lie groups and Lie algebras in the theory
- Compute the characters of certain Lie group / Lie algebra representations

Teaching methods

Lectures and problem sessions

Expected student activities

Students are expected to attend all lectures and participate in all problem sessions.

Assessment methods

One written homework (15% of the grade) and a written exam (85% of the grade).

Supervision

Office hours	No
Assistants	Yes
Forum	Yes

Resources

Bibliography

W. Fulton, J.Harris, "Representation Theory: A first course"
D. Bump, "Lie Groups"
A. Baker, "Matrix Groups: An Introduction to Lie Group Theory"

Ressources en bibliothèque

- [Introduction to Smooth Manifolds / Lee](#)
- [Lie groups, beyond an introduction / Knapp](#)
- [Matrix Groups / Baker](#)
- [Introduction to the Theory of Lie Groups / Godement](#)
- [Lie Groups / Bump](#)

Moodle Link

- <https://go.epfl.ch/MATH-429>