EPFL

MATH-429	**Lie groups**

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

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

Remark

pas donné en 2020-21

Summary

Lie groups are manifolds with a group structure. The interaction between the geometric and the algebraic structure of these objects gives rise to a rich and beautiful subject with various applications in physics and other branches of mathematics.

Content

- Lie groups and Lie algebras
- Classical groups
- The exponential map
- Lie subgroups and Lie subalgebras
- Homomorphisms between Lie groups
- Decomposition theorems

Keywords

Lie groups, Lie algebras, Classical groups

Learning Prerequisites

Required courses

Group Theory

Recommended courses

Introduction to differentiable manifolds

Lie algebras

Learning Outcomes

By the end of the course, the student must be able to:
- Define the main concepts introduced in the course
- state the theorems covered in the course and give the main ideas of their proofs
- apply the results covered in the course to examples
- deduce properties of a Lie group from the structure of its Lie algebra

Teaching methods

ex-cathedra teaching, exercise classes

Expected student activities

Attending the course, solving the weekly assignments, participating actively in the exercise classes

Assessment methods

Assignments, oral exam
Dans le cas de l'art. 3 al. 5 du Règlement de section, l'enseignant décide de la forme de l'examen qu'il communique aux étudiants concernés.

Teaching methods

ex-cathedra teaching, exercise classes