

MATH-479

Linear algebraic groups

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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	

Summary

The aim of the course is to give an introduction to linear algebraic groups over algebraically closed fields and to give an insight into a beautiful subject that combines algebraic geometry with group theory.

Content

first definitions and properties, morphisms, dimension, Jordan decomposition, tangent space
 commutative connected groups, tori, connected solvable groups,
 Lie algebra
 group actions on algebraic varieties and some invariant theory

Keywords

algebraic groups
 group actions on algebraic varieties
 Lie algebra
 algebraic geometry
 group theory

Learning Prerequisites**Required courses**

at least one introductory algebraic geometry course, group theory

Recommended courses

Background in group theory, Lie theory and some algebraic geometry

Learning Outcomes

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

- State the most important notions and results
- Construct examples
- Prove basic results in the theory

Teaching methods

Lectures and exercises

Expected student activities

exercises and presentations

Assessment methods

Part of the grade will be based upon student presentation of some course material during the exercise sessions or corrected written homework assignments, or both.

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.

Supervision

Office hours	Yes
Assistants	Yes
Forum	Yes

Resources

Bibliography

Linear Algebraic Groups, J. Humphreys, Springer

Linear Algebraic Groups, T. Springer, Birkhauser

Linear Algebraic Groups, A. Borel, Springer

Linear algebraic groups and finite groups of Lie type, G. Malle and D. Testerman, CUP

Références suggérées par la bibliothèque

- [Linear Algebraic Groups / Borel](#)
- [Linear algebraic groups and finite groups of Lie type / Malle & Testerman](#)
- [\(electronic version\)](#)
- [\(electronic version\)](#)
- [\(electronic version\)](#)
- [Linear Algebraic Groups / Humphreys](#)
- [Linear Algebraic Groups / Springer](#)
- [\(electronic version\)](#)