EPFL

MATH-479	**Linear algebraic groups**

Testerman Donna

Cursus	Sem.	Type
Ing.-math	MA2, MA4	Opt.
Mathematics for teaching	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 establish the main results on the structure of reductive linear algebraic groups defined over an algebraically closed field.

Content

first definitions and properties, morphisms, dimension, Jordan decomposition, tangent space
commutative connected groups, tori, connected solvable groups,
homogeneous spaces and quotients, Borel subgroups,
Lie algebra
root data and structure theorem

Keywords

reductive groups
semisimple
Lie algebra
root data

Learning Prerequisites

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:
- Formulate the classification theorem for simple linear algebraic groups
- Construct examples of simple linear algebraic groups
- Prove basic results in the theory

Teaching methods

Lectures

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

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)