MATH-317 **Galois theory**

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Cursus	Sem.	Type
Mathematics	BA5	Opt.

Language of teaching	English
Credits	5
Session	Winter
Semester	Fall
Exam	Written
Workload	150h
Weeks	14
Hours	**4 weekly**
Courses	2 weekly
Exercises	2 weekly
Number of positions	

Summary

This course is in an introduction to Galois theory, which is the study of automorphism groups of field extensions. Galois theory is essential for many fields of mathematics such as number theory, algebraic geometry, topology and many more.

Content

Ruler and compass constructions
Algebraic and transcendal numbers
Splitting fields, normaility and separability, soluble and simple groups
Automorphis groups of algebraic extensions and the Galois correspondence
Solution of polynomial equations by radical expressions and impossibility thereof for the quintic
Algorithms for calculating Galois groups
Construction of regular n-gons, theorem of Gauss-Wantzel

Keywords

polynomials, fields, algebraic extensions, group, Galois group

Learning Prerequisites

Required courses

Algèbre linéaire avancée I & II
Anneaux et corps

Learning Outcomes

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

- Demonstrate mastery of the basic elements of Galois Theory
- Describe lattice diagrams of algebraic extensions
- Compute Galois groups of small degree polynomials
- Prove basic theorems in Galois theory

Teaching methods

Ex-cathedra lectures and exercises

Expected student activities

Independent solution of exercises that are proposed during the course.

Assessment methods

Written exam

Supervision

Office hours	Yes
Assistants	Yes
Forum	Yes

Resources

Bibliography

Ian Stewart, Galois Theory, Chapman &Hall

Ressources en bibliothèque

- Galois Theory / Stewart