MATH-314 **Representation theory I - finite groups**

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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 is a standard course in representation theory of finite groups.

Content

This course is an introduction to representation theory. We start with basic notions and results in representation theory of associative algebras. The case of the representations of finite groups over C is treated in detail. We study the classical character theory with many examples. We introduce the notions of induction, restriction and tensor product of representations. In particular, we study the representations of symmetric groups over complex numbers.

Keywords

Representation, subrepresentation, irreducible representation, character, character tables, tensor product of representations, induced representation.

Learning Prerequisites

Required courses

Linear algebra

Recommended courses

Abstract algebra: groups

Learning Outcomes

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

- Analyze representations of a finite group
- Identify irreducible representation, subrepresentation
- Compute character of a representation
- Construct an induced representation
- Analyze a tensor product of representations

Teaching methods

Lectures and problem sessions.

Assessment methods

Written exam

Supervision

Assistant.e.s	Yes
Forum	Yes

Resources

Bibliography

P. Etingof et al., "Introduction to Representation Theory"
W. Fulton, J.Harris, "Representation Theory: A first course"

Ressources en bibliothèque

- Find the references at the Library

Notes/Handbook

Notes of the course will be available in PDF.

Moodle Link

- https://go.epfl.ch/MATH-314