

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
Lecture	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 study the basic notions and results in representations of finite groups. The classical character theory is treated in detail with many examples. 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

One written homework (15% of the grade) and a written exam (85% of the grade).

Supervision

Assistants	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

- [Introduction to Representation Theory / Etingof et al.](#)
- [Representation Theory / Fulton](#)

Moodle Link

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