MATH-502

Distribution and interpolation spaces

Radici Emanuela

Cursus	Sem.	Type
Ing.-math	MA1, MA3	Opt.
Mathématicien	MA1, MA3	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

The aim of this course is to provide a solid foundation of theory of Distributions, Sobolev spaces and an introduction to the more general theory of Interpolation spaces.

Content

After a brief review on weak topologies and other tools from functional analysis, we will introduce the concept of distribution and Fourier transform and we will pass then to the definition of Sobolev spaces. We will discuss preliminary results on Sobolev spaces, such as approximation results, extension operators, Sobolev immersions and useful Sobolev inequalities. Finally, we will introduce the theory of Interpolation spaces and we will see some relevant examples.

Keywords

Distributions, Sobolev Spaces, Interpolation Spaces

Learning Prerequisites

Required courses

- MATH-200: Analysis III
- MATH-205: Analysis IV
- MATH-303: Measure and integration

Recommended courses

- MATH-302: Functional analysis I

Learning Outcomes

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

- Demonstrate proficiency in statements
- Identify use and role of the assumptions
- Recognize which concepts and results could be used in a given context
- Describe concepts and proofs
- Apply theory to specific examples

Teaching methods

Lectures + Exercises

Assessment methods

Oral
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

Assistants Yes

Resources

Bibliography

"*Theory of Distributions*", Günther Hörmann & Roland Steinbauer.
"*A First Course in Sobolev Spaces*", Giovanni Leoni.
"*An Introduction to Interpolation Theory*", Alessandra Lunardi.

Ressources en bibliothèque

- A First Course in Sobolev Spaces / Leoni
- Theory of Distributions/ Hörmann
- An Introduction to Interpolation Theory / Lunardi