Functional analysis

ECTS : 8

Volume horaire : 78

Description du contenu de l'enseignement :

Detailed schedule :
CM : 39h00
TD : 39h00

1. Compactnes in metric spaces; Riesz compactness theorem; Arzelà-Ascoli theorem.

2. Hahn-Banach theorem, Baire category theorem, uniform boundedness principle, open mapping theorem, closed graph theorem.

3. Hilbert spaces: projection on a closed convex subset, orthonormal bases, Riesz representation theorem (review of last year's course); Lax-Milgram theorem.

4. Weak convergence in Hilbert spaces.

5. Spectrum of a bounded operator in a Banach space; the case of compact operators.

6. Self-adjoint compact operators in Hilbert spaces: the spectral theorem.

7. Sobolev spaces in one space dimension.

Compétence à acquérir :

This course presents classical results of functional analysis and some of their applications.

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