MATH2111 Functional analysis

[30h+15h exercises] 5 credits

This course is taught in the 1st semester

Teacher(s): Michel Willem
Language: French
Level: Second cycle

Aims

Aims to provide with the bases of functional analysis necessary to a modern study of partial differential equations, optimisation problems, numerical analysis, etc.

Main themes

- Hahn-Banach, Banach- Steinhaus, closed graph theorems.
- Lebesgue Lp spaces : completeness, density, regularization, compactness.
- Duality and weak convergence : duality of spaces Lp, weak sequential compactness, etc.
- Weak derivatives and Sobolev spaces
- Spectral theory: compact operators, etc.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Evaluation: quaterly written examination.
References: H. Brezis, Analyse fonctionelle; M. Willem, book in preparation

Other credits in programs

MAP22	Deuxième année du programme conduisant au grade d'ingénieur civil en mathématiques appliquées	(5 credits)	
MATH21/E	Première licence en sciences mathématiques (Economie mathématique)	(5 credits)	Mandatory
MATH21/G	Première licence en sciences mathématiques (Général)	(5 credits)	Mandatory
MATH21/S	Première licence en sciences mathématiques (Statistique)	(5 credits)	Mandatory