

- Faculté des sciences
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## Finite fields (3MT2060)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
<b>Bachelor en mathématiques</b>	<b>Cours: 2 ph Exercice: 2 ph</b>	<b>oral: 30 min</b>	6
<b>Bachelor en sciences et sport (mathématiques)</b>	<b>Cours: 2 ph Exercice: 2 ph</b>	<b>oral: 30 min</b>	6
<b>Master en mathématiques</b>	<b>Cours: 2 ph Exercice: 2 ph</b>	<b>oral: 30 min</b>	6
<b>Pilier principal B A - mathématiques</b>	<b>Cours: 2 ph Exercice: 2 ph</b>	<b>oral: 30 min</b>	6

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

### Période d'enseignement:

- Semestre Automne

### Equipe enseignante:

Professor: Elisa Gorla  
Assistant: Maike Massierer

### Objectifs:

Finite fields are fields which have finite cardinality. In this course, we will learn the basics of the theory of finite fields. They are important in number theory, finite algebraic geometry, Galois theory and are an essential mathematical foundation of cryptography and coding theory. In this course we will focus on the theoretical aspects, and mention some applications as time allows. Separate courses in coding theory and cryptography are offered, which assume knowledge of finite fields.

### Contenu:

1. Review of algebraic foundations (fields, polynomials, field extensions).
2. Structure of finite fields (roots of irreducible polynomials, trace, norm, bases, roots of unity).
3. Polynomials over finite fields(irreducibility, factorization).
4. Linear recurring sequences.

### Forme de l'évaluation:

Oral exams of 30min.

### Documentation:

R. Lidl, H. Niederreiter - Introduction to finite fields and their applications.

### Pré-requis:

Linear algebra, Algebra.

### Forme de l'enseignement:

Ex cathedra.