



## MAT1231 Multilinear algebra and group theory

[30h+30h exercises] 6 credits

This course is taught in the 2nd semester

**Teacher(s):** Jean-Roger Roisin, Jean-Pierre Tignol  
**Language:** French  
**Level:** First cycle

### Aims

After this course, students should be able to use tensor products and exterior products of vector spaces and linear maps, in analysis, geometry and physics as well as in a purely algebraic context. They should be able to use the fundamental notions of group theory in various situations, including combinatorial problems. In general terms, the course aims to develop reasoning and calculating skills in the context of abstract and discrete structures.

### Main themes

Complements of linear algebra: quotient spaces, duality of finite-dimensional vector spaces;  
 Multilinear algebra: tensor product, exterior product of vector spaces and linear maps.  
 Elements of the theory of groups and their representations: symmetric groups, linear groups and group actions.

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

Prerequisites: A first course in linear algebra

### Other credits in programs

<b>FSA13BA</b>	Troisième année de bachelier en sciences de l'ingénieur, orientation ingénieur civil	(6 credits)	
<b>MATH12BA</b>	Deuxième année de bachelier en sciences mathématiques	(6 credits)	Mandatory