


 Faculty of Applied Sciences

**FSAB1101 Mathematics 1**

[30h+30h exercises] 6 credits

This course is taught in the 1st semester

**Teacher(s):** Philippe Delsarte, Michel Verleysen, Vincent Wertz (coord.)  
**Language:** French  
**Level:** First cycle

**Aims**

Following this course, the students will be able to :

Content-oriented objectives :

- " manipulate real functions of a single variable;
- " master the basic notions of linear algebra;
- " model simple phenomena using first order differential equations, and solve these equations;

Method-oriented objectives:

- " analyze a mathematical statement, with the required rigor;
- " formulate and write short proofs with the required rigor;
- " read critically a mathematical statement;
- " illustrate statements with examples and counterexamples;
- " understand the various ways of mathematical proving techniques.

**Main themes**

- " real valued functions of a single variable; first order differential equations; linear algebra;
- " proofs of some fundamental theorems in calculus and algebra;
- " construction of proofs for simple properties;
- " modelling using first order differential equations.

**Content and teaching methods**

Contents and Methods

- " Sets - relations - functions
- " limits - continuity - derivative - integral
- " parametric curves - first order differential equations
- " complex numbers - complex exponential - sequences and series
- " linear algebra : systems of linear equations - matrix algebra - vector spaces - linear maps

The teaching methodology should promote the student's active involvement in his/her own acquisition of the course material.

The specific implementation of this methodology is left to the lecturer's best judgement, in accordance with the pedagogical guidelines set out by the Faculty.

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

The evaluation has 2 components: an intermediary evaluation during the quadrimester and a final exam at the end of the quadrimester (written exam). The final mark is a combination of the scores in these two evaluations

- Workfiles for each of the parts (available on the website and in printed version); Reference book: University Physics (Freedman and Young)

**Other credits in programs**

<b>ARCH11BA</b>	Première année de bachelier en sciences de l'ingénieur, orientation ingénieur civil architecte	(6 credits)	Mandatory
<b>ARCH12BA</b>	Deuxième année de bachelier en sciences de l'ingénieur, orientation ingénieur civil architecte	(6 credits)	
<b>FSA11BA</b>	Première année de bachelier en sciences de l'ingénieur, orientation ingénieur civil	(6 credits)	Mandatory
<b>FSA12BA</b>	Deuxième année de bachelier en sciences de l'ingénieur, orientation ingénieur civil	(6 credits)	