



## MAT1121 Mathematical analysis 1

[30h+30h exercises] 5 credits

This course is taught in the 1st semester

**Teacher(s):** Thierry De Pauw, Patrick Habets, Jean Mawhin (coord.)  
**Language:** French  
**Level:** First cycle

### Aims

This course aims at developing the following skills: mastery of the language, rigor in the analysis of a proposition, search for relevant examples, precision in the expression and understanding of the various methods of proofs. More precisely, it deals with the mathematical aspects of the notions of continuity, convergence, derivative and integral. It aims at developing the basic methods of explicit resolution of differential equations and it offers an outlook towards fields of applications. This first course in mathematical analysis presents the basic notions and results with rigor and intuition : convergence, continuity, derivative, integral. The lectures will also contain an introduction to explicit solutions for differential equations and openings to various applications fields.

### Main themes

This first part covers basic notions in elementary analysis such as the Real Number System, Elementary Set Theory, Limit, Continuity, Derivative for real functions. It covers both the concepts, its properties and fundamental results such as the Intermediate Value Theorem, Weierstrass Theorem, Rolle's Theorem and the Mean Value Theorem.

### Content and teaching methods

The course will contain three parts : synthesis of the basic tools from secondary school, one variable calculus, ordinary differential equations

### Other credits in programs

<b>MAFY11BA</b>	Première année polyvalente en sciences mathématiques et physiques	(5 credits)	Mandatory
-----------------	---	-------------	-----------