



## MAT1151 Numerical analysis : tools and software of calculus

[30h+45h exercises] 7 credits

This course is taught in the 2nd semester

**Teacher(s):** Pierre Bieliavsky  
**Language:** French  
**Level:** First cycle

### Aims

Besides the construction of numerical methods starting from basic principles, the course will present an introduction to the theory of errors and the evaluation of efficiency of the algorithms presented. This should lead the student to be able to use programs and software used in numerical computations.

### Main themes

Theory of errors in numerical analysis, direct and iterative methods of resolutions of linear systems numerical resolutions of non-linear systems, numerical integration and numerical resolution of ordinary differential equations. Part of the exercices will be devoted to the knowledge of a particular software in numerical analysis. This activity will lead to a project consisting into the numerical resolution of a specific problem. This course gives also the opportunity to give numerical solutions to problems met in the other courses.

### Content and teaching methods

The following subjects will be considered : calculus of errors, the direct and iterative methods of resolutions of linear systems, the numerical resolution of non-linear systems, the numerical integration and the numerical resolution of ordinary differential equations

### Other credits in programs

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| <b>MAFY11BA</b> | Première année polyvalente en sciences mathématiques et physiques | (7 credits) | Mandatory |
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