

Academic year 2025/2026

Courses offered by the programme

Mathématiques appliquées (MA)

Semester(s) :

Curricula are organized in groups of courses (Unités d'Enseignement (UE)), consisting of several courses (Éléments Constitutifs (EC)). An EC is a teaching module including lectures (cours magistraux (CM)), tutorials (travaux dirigés (TD)), laboratory work (travaux pratiques (TP)), projects (PR), conferences (CONF), personal work (TA) and possibly other pedagogical activities (DIV). Some internships (stages (ST)) are compulsory

Commonly used abbreviations

CM : Lectures

TD : Tutorials

TP : Laboratory Work

CONF : Conferences

TA : Personal Work

PR : Project

ST : Internship

DIV : Miscellaneous

Partial Differential Equations	GMA06-EDP
Number of hours : 28.00 h	2.00 ECTS credit
CM : 14.00 h, TD : 14.00 h	
Reference Teacher(s) : LEY Olivier	

Objectives :

The main types of partial differential equations from physical models. Introduction to exact and approximate solution methods.

Content :

1. Basic laws of conservation in single dimension: Study of the equation of advection.
2. Systems of laws of conservation: Motion of a fluid in a tube. Study of the wave equation in one dimension.
3. Phenomenon of diffusion: Fourier type equation. Resolution method by Fourier analysis.
4. Stationary problems: Poisson-type equations. Simple examples of numerical methods.

Bibliography :

"Partial Differential Equations - Modeling, Analysis, Computation"
 R.M. MATTHEIJ, S.W. RIENSTRA, J.H. TEN THIJE
 BLOONKKAMP, SIAM Monographs on Math. Modelling (2005)

Requirements :

Systems of differential equations.
 - Elementary analysis of functions of multiple variables.
 - Fourier's series.

Organisation :

12 hours.

Evaluation :

Two-hour written examination.

Target :