

M1 – Course description **MU4PYA03**

Course:	Code Apogée UE : MU4PYA03	
	Nombre d'ECTS : 6	
Course coordinators:	Sorbonne Université Name: Andrea Ciardi Address : 4 Place Jussieu, 75005, Paris Phone : 0144277602 Email: andrea.ciardi@obspm.fr	Université de Paris Name: Sebastien Charnoz Address : 1 rue Jussieu, 75005 Paris Phone : 0183957715 Email: charnoz@ipgp.fr
Number of hours:	60	
Semester :	1	
Lecture localization:	Campus Jussieu (Sorbonne Université), Atrium	
Laboratories:	no	
Objectives:	Acquire a basic knowledge of computational methods to solve physics problems.	
Prerequisites:	Basic knowledge of computer programming, some knowledge of Python would be useful.	
Topics/program:	Interpolation, extrapolation. Root finding. Integration. Numerical stability, numerical accuracy Ordinary differential equations Partial differential equations. Optimization, minimization. Linear algebra, matrix inversion Monte Carlo integration and algorithms.	
Competences expected after the course:	At the end of the course the students will have acquired a basic knowledge of <ul style="list-style-type: none"> - selected algorithms on interpolation, numerical integration, root finding, etc. - numerical techniques to solve ordinary and partial differential equations - a selection of Montecarlo techniques 	
Bibliography:	Numerical Recipes , Press & Teukolsky, Cambridge University Press Computational Physics, Landau et al, Wiley-VCH	
Evaluation :	Continuous evaluation. Reports of practical work 60% Class work 40%	
Barèmes (Apogée) :	TP : 100%	