Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
MAT203	Differential Equations	3	4	0	0	4	7

Prerequisites	
Admission Requirements	

Language of Instruction	French
Course Type	Compulsory
Course Level	Bachelor Degree
Objective	To master: Existence and uniqueness of the solution to ordinary differential equation, Lipschitz condition, second-order linear differential equation, linear system of first-order differential equations.
Content	Existence and uniqueness of the solution to ordinary differential equation, Lipschitz condition, second-order linear differential equation, linear system of first-order differential equations.
References	Equations différentielles ordinaires, Etudes qualitatives, Dominique Hulin, Notes de Cours à L'université Paris Sud. Cours de mathématiques, tome 4 : Équations différentielles, intégrales multiples - Cours et exercices corrigés, Jacqueline Lelong-Ferrand et Jean-Marie Arnaudiès, Dunod. Calcul différentiel et équations différentielles - Sylvie Benzoni-Gavage Mathématiques tout-en-un pour la licence 2 - Halberstadt, Ramis, Sauloy, Buff, Moulin Équations différentielles ordinaires - Millot Équations différentielles ordinaires - Gallouet

Theory Topics

Week	Weekly Contents
1	Gneralities and first definitions
2	Linear differential equations
3	Linear differential equations with constant coefficients
4	Phase portrait
5	Midterm 1
6	Cauchy-Lipschitz theorem
7	Grönwall's inequality
8	Autonomous vector fields
9	Regular and stationary points
10	midterm 2
11	Lyapunov stability
12	Bifurcations
13	Solution operator
14	Wronskian