Faculty of Sciences

MATH2460 Mathematical introduction to dynamic systems

[30h+15h exercises] 3 credits

This course is not taught in 2005-2006
This course is taught in the 2nd semester
Language: French
Level: Second cycle

Aims

- To understand the different types of behavior of dynamic, continuous and discreet systems.
- To master the analysis tools of dynamic systems and of non-linear oscillation studies: results of stability, existence results of periodic solutions, tampering methods, bifurcation theorem, etc.
- To be capable of applying the theory to the analysis of examples.

Main themes

- Presentation of basic notions of dynamic systems (discreet or continuous): balance points, periodic solutions and their stability, stable varieties and instabilities, Hartman-Grobman theorems, etc.
- Initiation to analysis methods of dynamics systems and non-linear oscillations.
- Study of results of local and global bifurcations.
- Study of strange attractors.
The course will be illustrated by applications.
This optionnal course is for various people, its content will be adapted at best depending on the notions already acquired and the interests of the students.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Prerequisites: first course of differential equations (for example, INMA 2390).
Reference books:
- Guckenheimer J., Holmes P., Nonlinear Oscillations, Dynamical Systems, and Bifurcations of Vectors Fields, Springer, 1983.
- Stuart, A.M., Humphries, A.R., Dynamical Systems and Numerical Analysis, Cambridge University Press, 1999.

Other credits in programs

MATH21/G   Première licence en sciences mathématiques (Général)   (3 credits)