COURSE DETAIL

NONLINEAR DYNAMICS AND CHAOS
Country Canada
Host Institution McGill University
Program(s) McGill University
UCEAP Course Level Upper Division
UCEAP Subject Area(s) Mathematics
UCEAP Course Number 124
UCEAP Course Suffix
UCEAP Official Title NONLINEAR DYNAMICS AND CHAOS
UCEAP Transcript Title NONLINEAR DYN&CHAOS
UCEAP Quarter Units 6.00
UCEAP Semester Units 4.00

Course Description
This introductory course on dynamical systems is mainly concerned with linear systems, and one and two-dimensional nonlinear systems of differential equations (low-dimensional nonlinear systems of differential equations, and iterations of low-dimensional maps). Students investigate how to determine the qualitative behavior of the solutions of these differential equations, without having to determine the actual solutions explicitly. This is an applied mathematics course; the main focus is on understanding and explaining the behavior of solutions to differential equations, as opposed to a pure mathematics course where the focus might be more on stating and proving theorems. Topics include linear systems of differential equations (linear stability theory) and nonlinear systems (existence and uniqueness, numerical methods, one and two-dimensional flows, phase space, limit cycles, Poincare-Bendixson theorem, bifurcations, Hopf bifurcation, the Lorenz equations, and chaos).

Language(s) of Instruction
English

Host Institution Course Number
MATH 326

Host Institution Course Title
NONLINEAR DYNAMICS AND CHAOS

Host Institution Course Details

Host Institution Campus
Science

Host Institution Faculty

Host Institution Degree

Host Institution Department
Mathematics and Statistics

Course Last Reviewed

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