

Introduction to Dynamical Systems

Course Website: www.math.mun.ca/~ou

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Office Hours: Monday 10:00–1:00pm, Wednesday 10:00–1:00pm.

Lectures: Slot 19 (TT 2:00–3:15), Classroom A1045.

Text **Nonlinear Dynamics and Chaos**, by Steven Strogatz

Prerequisite: AM/PM 2260

Evaluation: 10% assignments, 30% Midterm Test, 60% Final Examination.

Important Dates: Midterm test : Feb 13 and March 15 (tentative).

Notes:

- Attendance will be taken at the classroom.
- Whereas cooperative study is encouraged in this course, copying and plagiarism are serious academic offenses.

Course Outline

- One-dimensional flows: phase portraits, fixed points and stability, bifurcations(Chapters 2 and 3).
- Two-dimensional flows: classification of linear systems, phase plane analysis, linearization and the jacobian matrix, limit cycles and the Poincare-Bendixson Theorem, bifurcations, Poincare maps, applications(Chapters 4–8)
- One-dimensional maps:fix points and stability, graphical methods, logistic map, period-doubling bifurcation, chaos.(Chapter 10)
- Chaos: Strange attractors, chaos in maps, chaos in the three-dimensional flows, examples. (Chapters 9 and 12)