MATH 345 (3) Applied Nonlinear Dynamics and Chaos
Section 201
Session 2014W, Term 2
(January–April 2015)

Phase plane methods, bifurcation and stability theory, limit-cycle behavior and chaos for nonlinear differential equations with applications to the sciences. Assignments involve the use of computers.

Prerequisite: A grade of 68% or higher in one of MATH 215, MATH 255, MATH 256, MATH 265.

Recommended textbook (not required):
Steven Strogatz, *Nonlinear Dynamics and Chaos*, Westview Press (2014).

Course web page:
http://www.math.ubc.ca/∼nagata/m345/

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Office hours:
Tu Th 15:30–17:00

Topics (see course web page for more details):

1. Flows on the line, bifurcations, flows on the circle, population dynamics, mechanical systems, chemical reactions.

2. The phase plane, limit cycles, more bifurcations.

3. Chaos in differential equations and maps.

Evaluation:

Homework assignments	30%
Midterm test	20%
Final examination	50%

Homework assignments involve the use of computers – see the course web page for more details.