

DEPARTMENT OF MATHEMATICS, NORTHEASTERN UNIVERSITY

MTH G131: Introduction to mathematical methods and modeling.

Instructor: Chris King : king@neu.edu ; 437 Lake Hall; ext x3905

Class hours: Monday, Wednesday 5:50 – 7:20 pm, Location TBA

Primary Text: “A first course in differential equations”, by J. David Logan, (pub. Springer).

Secondary Texts: “Nonlinear Dynamics and Chaos”, by Steven Strogatz (Westview Press, 1994); “Elementary Differential Equations”, by Boyce and DiPrima (Wiley).

Office hours: TBA

Course outline:

Introduction to mathematical methods with emphasis on applications and modeling using ordinary differential equations. Topics covered include analytical and numerical methods for solutions of ODE's; matrix methods, with applications to systems of ODE's (and discrete Markov chains if time allows); Laplace and Fourier transforms. Applications will be chosen to illustrate the power and versatility of mathematical methods in a variety of applied fields. Computer projects will be used to further develop the connections between theory and applications. The text will be supplemented by notes and other sources of applications material.

Homeworks: One weekly homework assignment, and end of course project, worth approx. 40% of grade.

Tests: One in-class test (approx. 20%), and the final exam (approx. 40%).

Extras: The course will involve theory as well as problem solving and applications. The weekly homework assignment is an essential part of the course, and it will be graded every week.