

Math 237, Differential Equations and Computer Methods Fall 2011

Queen's University, Department of Mathematics

Lectures in Jeffrey Hall Rm 127, Labs in Jeffrey Hall Rm 155

Instructor: Daniel Offin, 408 Jeffrey Hall, offind@mast.queensu.ca

Webpage and announcements: TBA

Grading: 15 homework, 10 maple assignments, 30 midterm exam, 45 final exam

Office Hour: Wed 10:30-11:30

Recommended Text: Boyce and DiPrima, Elementary Differential Equations and Boundary Value Problems, 8th or 9th Ed.

Class times: Mon 12:30, Tues 3:30, Thurs 4:30. Tutorials: Mon 8:30, Thurs 1:30

Maple Tutorial: available at the main office

Course Information: Many physical, biological, chemical, engineering etc. systems can be modelled by differential equations or systems of differential equations. Historically this was done starting in 1666 when Newton attempted to describe and predict the motions of the planets in the solar system, in gravitational interaction with the sun and each other. By the mid 20th century, every scientific discipline began to use some form of differential equations to model their respective systems. This modelling procedure requires that we understand the basic theory of the topic of differential equations. In order to make predictions from the models, we need to also understand how the simplest and most elementary differential equations may be solved by exact methods. We also want to see what these solutions mean, both algebraically and geometrically. For more complex systems, we can turn to algebraic computer methods which will allow us to get solutions even if the dimension of the system is large. We will use Maple to perform these algebraic and numerical routines, and try to understand how these numerical solutions can be of direct use. The course is primarily intended for students in the Engineering Mathematics and Engineering Physics programs.