Preface

Welcome!

The approach to differential equations taken in this course reflects the following principles:

- **Dynamical systems.** We primarily focus on differential equations which describe the dynamics of some system. This leads us to spend a lot of time studying initial value problems for first order systems.

- **Qualitative methods.** This course has a strong emphasis on describing qualitative features of solutions to differential equations. Technical aspects of existence theory, and construction of explicit solutions, are of secondary concern in this approach.

- **Modeling.** Differential equations are useful for modeling a wide variety of phenomenon across many academic disciplines. While we focus on models from the physical and life sciences, we emphasize methods which apply to models from any discipline.

- **Technology.** Technology is used as a tool to study differential equations, as well as to communicate the result of those studies in an effective and elegant fashion.

- **Writing.** The course emphasizes not only mathematical tools for analyzing differential equations, but also communicating the results of such analyses in written reports.

Course plan

Here is a typical course plan for a 15 week semester.

Weeks 1 & 2 Chapter 1, together with a day in the computer lab.

Weeks 3 & 4 Chapter 2, followed by an exam covering Chapters 1 & 2.

Weeks 5–7 Chapter 3.

Week 8 Chapter 4.

Week 9 A few flex days, followed by an exam covering Chapters 3 & 4.

Weeks 10 & 11 Chapter 5.

Weeks 12 & 13 Chapter 6.

Weeks 14 & 15 Exam covering Chapters 5 & 6, followed by one of the remaining chapters.

For Fall 2016, please note the following special dates:

Wednesday 7 September Technology Day! We meet in the computer lab in the evening.

Friday 23 September Exam 1. This exam takes place during the usual class time.

Tuesday 25 October, Wednesday 26 October Exam 2. This is a two hour long exam. Students have the option of taking the exam either on Tuesday evening (starting at 7pm) or on Wednesday morning (starting at 8am).

Monday 28 November Exam 3. This exam takes place during the usual class time.

Corrections & changes

As is the case with any document this size, there are bound to be errors present in this document. If you notice an error, please let Paul know! A list of corrections will be posted on the course website.