Math 4190/5190 - Ordinary Differential Equations

1 Course Outline

Text: There is no required text for this course, but the following texts should be available in the library and may be used as references.

- D. K. Arrowsmith and C. M. Place [1990], *An Introduction to Dynamical Systems*, Cambridge Press
- J. Hale and H. Kocak [1991], *Dynamics and Bifurcations*, Springer-Verlag
- S. Wiggins [1990], *Introduction to Applied Nonlinear Dynamical Systems and Chaos*, Springer-Verlag

This course will focus on finding the behaviour of dynamical systems which cannot be solved exactly. The course will begin with an introduction to dynamical systems (discrete and continuous). We will consider local bifurcations and finally global dynamics such as the saddle-loop bifurcation and the Smale horseshoe map. Other topics, to be chosen by class interest, may be considered.

All homework assignment and handouts will be available from the web page in pdf format. If you have any problems downloading of viewing/printing these documents please let me know.

2 General Information

Instructor David Iron

Times Mon. Wed and Fri. 9:35-10:25

Location The lectures will be held in Chase 319.

Web Page http://www.mathstat.dal.ca/~iron/math4190/index.html

Office hours Thursday and Friday 1:00-2:300

3 Instructor Information

Name David Iron

Office Chase 308

Phone (902) 494-2385

email `iron@mathstat.dal.ca`

4 Grading

Homework 60%

Final Project 40%

For students enrolled in 4190, each homework will contain optional bonus questions. For students enrolled in 5190 all of the assignment questions will be graded normally.

The final project will be composed of both a written report and an oral presentation. The written report will be due on the last day of classes and should be roughly 15-20 double spaced pages in length. It may be typed, Latexed or handwritten as long as it is legible. Original mathematical results are not required, but the mathematics should be a relatively current. I will supply a list of papers you may wish to choose your topics from. A some point in the term every student must discuss and get approval of a research topic for their final paper.

The oral presentations should be roughly 20 minutes in length and will all take place during the final week of classes.

5 Grading Scheme

The grading scheme is as follows:

$[0, 50) = F$	$[55, 58) = C-$	$[65, 70) = B-$	$[80, 85) = A-$
$[50, 55) = D$	$[58, 62) = C$	$[70, 75) = B$	$[85, 90) = A$
	$[62, 65) = C+$	$[75, 80) = B+$	$[90, 100] = A+$

6 Final Notes

- Late homework will be penalized at 10% per day.
- Homework will be accepted as on time up to 6:00pm on the due date. Email submissions will be accepted, but must be in either pdf or postscript format. I will not accept Word documents or any other proprietary formats.
- The university policy states that all cases of academic misconduct *must* be handled through official channels. I have no latitude in this matter. I do encourage people to work in groups, but I must insist that each student write up their own homework. Please read the paragraph on academic honesty on pages 25-26 in the Calendar.
- Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic under the Nova Scotia Human Rights Act. Students who require academic accommodation for either classroom participation or the writing of tests and exams should make their request to the Advising and Access Services Center (AASC) prior to or at the outset of the regular academic year. Please visit www.dal.ca/access for more information and to obtain the Request for Accommodation – Form A.