Ordinary Differential Equations
Math 1270 Winter 2010,
CRN 14004

George Sparling
Laboratory of Axiomatics
University of Pittsburgh
Pittsburgh, Pennsylvania, USA

Course Information

- **Classes**
  This class is Mathematics 1270, CRN 14004, Differential Equations.
  The classes are in Thackeray 627, Tuesdays and Thursdays 7.20-8.35pm.
  The first class is Thursday January 7th, 2010.
  The last class is Thursday April 29th, 2010.

- **Instructor**   George Sparling
  **Office**       609 Thackeray
  **Text/Phone**   1-412-576-1429

- **e-mail**      gnilraps@gmail.com
- **webpage**     http://www.math.pitt.edu/ sparling.

- **Office hours**
  For the period 19/1/10-5/3/10, Mondays 3-4pm, Tuesdays and Thursdays, 4.15pm-5.55pm
  In the Math Lounge, 705 Thackeray, or by appointment.
• Grader
  The grader for the homework is Xuanzi Tong, GCC127, xut1@pitt.edu

Class Schedule

• Every second week, there will be a quiz or an exam.
• Quizzes and exams will be open book.
• Every week there will be a homework due.
• Homewors will be six problems each at five points.

Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Homework/Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday January 7th</td>
<td>Homework 1 assigned</td>
</tr>
<tr>
<td>Thursday January 14th</td>
<td>Homework 1 due, Homework 2 assigned</td>
</tr>
<tr>
<td>Thursday January 21st</td>
<td>Homework 2 due, Homework 3 assigned</td>
</tr>
<tr>
<td>Thursday January 28th</td>
<td>Homework 3 due, Homework 4 assigned</td>
</tr>
<tr>
<td>Thursday February 4th</td>
<td>Homework 4 due, Homework 5 assigned</td>
</tr>
<tr>
<td>Thursday February 11th</td>
<td>Homework 5 due, Homework 6 assigned</td>
</tr>
<tr>
<td>Thursday February 18th</td>
<td>Homework 6 due</td>
</tr>
<tr>
<td>Thursday February 25th</td>
<td>Homework 7 due, Homework 8 assigned</td>
</tr>
<tr>
<td>Thursday March 4th</td>
<td>Homework 7 due, Homework 8 assigned</td>
</tr>
<tr>
<td>Thursday March 18th</td>
<td>Homework 8 due, Homework 9 assigned</td>
</tr>
<tr>
<td>Thursday March 25th</td>
<td>Homework 9 due, Homework 10 assigned</td>
</tr>
<tr>
<td>Thursday April 1st</td>
<td>Homework 10 due, Homework 11 assigned</td>
</tr>
<tr>
<td>Thursday April 8th</td>
<td>Homework 11 due, Homework 12 assigned</td>
</tr>
<tr>
<td>Thursday April 15th</td>
<td>Homework 11 due, Homework 12 assigned</td>
</tr>
<tr>
<td>Thursday April 22nd</td>
<td>Homework 12 due, Homework 13 assigned</td>
</tr>
<tr>
<td>Thursday April 29th</td>
<td>Homework 13 due</td>
</tr>
<tr>
<td></td>
<td>Final Exam in class, Thackeray 627, 6:00pm</td>
</tr>
</tbody>
</table>
Grading

There are thirteen homeworks, five quizzes, two midterm exams and a final exam during the term.

Grading Scheme

- Best 10 homeworks at 30 points each 300pts
- Best 4 quizzes at 40 points each 160pts
- Two midterm examination at 120 points each 240pts
- One final examination at 200 points 200pts
- Maximum Possible Score 900pts

Grading is curved and based on your total score only, provided you pass the final.

If you pass the final, your grade will be in the A+ to B- range, unless your other work is severely lacking.
If you fail the final, your grade will be in the range C+ to F.

Textbook and Syllabus

- Text
  The text for this course is:
  Differential Equations with Boundary Value Problems, by John Polking, Albert Boggess and David Arnold
Syllabus; Problem Sets

Week 1 to 1/7
Modeling; 1st order equations
1.1 : 1 – 11
2.1 : 1 – 6, 12 – 15

Week 2 to 1/14
Variable Separation; Plotting
2.2 : 1 – 18, 33 – 35
2.3 : 8 – 10
2.4 : 1 – 21
2.5 : 1 – 10

Week 3 to 1/21
Modeling; DFIELD
3.1 : 10 – 13,
3.3 : 3 – 5
3.4 : 1 – 10

Week 4 to 1/28
Second order equations
4.1 : 1 – 20
4.3 : 1 – 36
4.4 : 1 – 12

Week 5 to 2/4
Second order equations
4.5 : 1 – 29
4.6 : 1 – 10
4.7 : 3 – 6, 12 – 15

Week 6 to 2/11
Numerical methods
6.1 : 1 – 5

Week 7 to 2/18
Systems
8.1 : 1 – 16
8.2 : 13 – 16 (use PPLANE7)
8.3 : 1 – 6
Week 8 to 2/25
Constant coefficient systems
9.1 : 1 – 8, 16 – 23
9.2 : 1 – 27, 58 – 59
9.3 : 1 – 23

Week 9 to 3/4
Geometry of non-linear systems
10.1 : 1 – 18
10.2 : 1 – 4
10.3 : 1 – 16

Week 10 to 3/18
Laplace transforms
10.5 : 1 – 24
5.1 : 1 – 29
5.2 : 1 – 41

Week 11 to 3/25
Laplace Transforms
5.3 : 1 – 36
5.4 : 1 – 26
5.5 : 1 – 25

Week 12 to 4/1
Laplace Transforms
5.6 : 1 – 9

Week 13 to 4/8
Fourier series
12.1 : 1 – 17
12.3 : 1 – 32

Week 14 to 4/15
Heat equation
13.1 : 1 – 9
13.2 : 1 – 18

Week 15 to 4/22
Review

Week 16 to 4/29
Review