MATHEMATICS 256 Section 201

DIFFERENTIAL EQUATIONS

INSTRUCTOR:

- Joel Feldman
- Math building room 221
- 822-5660
- feldman@math.ubc.ca
- http://www.math.ubc.ca/~feldman/

TEXT:

W. Boyce and R. C. Diprima, Elementary Differential Equations and Boundary Value Problems, any edition.

I will post all handouts, problem sets, final grades, etc. on the web at
http://www.math.ubc.ca/∼feldman/m256/

TOPICS:

1. First order ordinary differential equations (4 hrs)
   - Linear equations. §2.1-2
   - Separable equations. §2.3
   - Applications. §2.5
2. Numerical methods (4 hrs)
   - Euler's method. §8.1
   - Error and extrapolation. §8.2
   - Higher-order methods. §8.3-4
3. Second order constant coefficient equations (7 hrs)
   - Homogeneous equations. §3.1-2
   - Complex roots. §3.4
   - Nonhomogeneous equations. §3.6
4. Linear systems of first-order ODE's (6 hrs)
   - Homogeneous systems: eigenvalues and eigenvectors. §7.5-6
   - Nonhomogeneous systems. §7.9
   - Phase portraits. §9.1
5. Fourier series. §10.2-4 (3 hrs)
6. Partial differential equations (10 hrs)
   - Heat equation. §10.1,5
   - Wave equation. §10.6
   - Laplace's equation. §10.7

GRADING:

- There will be two midterms (on Friday, February 4 and Wednesday, March 8) accounting for about 40% of the final mark.
- There will be weekly problem sets.
- There is computer lab accounting for about 10% of the final mark.
- The final exam will account for about 50% of the final mark.
- Grades **will** probably **be scaled**.