

**MATH 440/540**  
**Applied Mathematics I**  
**Spring 2009**  
*M, W, F 11:10-12, CUE 409*

**Instructor:** Sergey Lapin

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**Required book:** Erwin Kreyszig *Advanced Engineering Mathematics, 9th edition*

**Course outline:**

1. Review of First and Second order ordinary differential equations
2. Series solutions of ordinary differential equations
  - (a) Legendre polynomials
  - (b) Frobenius method
  - (c) Bessel functions
  - (d) Sturm-Liouville problems
3. Laplace transforms and inverse transforms
4. Partial differential equations
  - (a) Hyperbolic equations: wave equation and its solution
  - (b) Parabolic equations: heat equation and its solution
5. Numerical solution of differential equations

**Grading:**

- Homework assignments - 40%
- Final project - 60%