Advanced Undergraduate Engineering Math Methods

Lectures: MWF 10:10-11:00 in BH105
Instructor: Peter Sternberg    Office: Rawles 243
Email: sternber@indiana.edu    Phone: 855-6726
Office Hours: Monday 8:30-9:30am, Tuesday 12:30-2:30. There is no need to make an appointment for these hours. Please email me or talk to me after class if you need to make an appointment outside of these hours.
Prerequisites: M211-M212 (single variable calculus) and M343 (introductory ordinary differential equations).
Topics Covered: We will cover elements of all ten chapters, depending, in part, on the background of the class. This includes a review of one variable calculus (M211-M212) and scalar ordinary differential equations (M343), a brief overview of key points from multi-variable calculus, a look at basic notions from linear algebra, and, time-permitting, a brief look at systems of ODE’s and at partial differential equations.
Homework: Assignments will be made on a weekly basis and will generally be due each Wednesday at the beginning of class. It is fine to discuss homework with other students but homework must be written in your own words and understood by you, not just copied from a classmate. Assignments can be found on my webpage. See below for the site.
Webpage: http://mypage.iu.edu/~sternber/ See this page for weekly homework assignments and other class information.
Exams: There will be two in-class midterms given during the semester:
Tentatively Exam 1 is scheduled for October 3
Tentatively Exam 2 is scheduled for November 14
However, please note: these dates may change so pay attention to announcements in class and on my webpage.
**Final Exam:** The final exam is on Friday, December 14 from 8:00-10:00 am.

**Grading Policy:** The course grade will be based on a total of 375 possible points, divided as follows:
- HOMEWORK: 100 points
- EACH MIDTERM: 75 points
- FINAL EXAM: 125 points

**Tentative Schedule:**
- **Weeks 4-9 (Sept. 10-Oct 19):** Linear algebra including vectors, matrices, lines and planes, linear independence, basis, dimension, linear systems and Gaussian elimination, linear transformations, determinants, eigenvalues and eigenvectors.

Exam 1 will occur on October 3

Weeks 10-15 (Oct. 26-Nov. 30): Multi-variable calculus including partial derivatives, gradients, directional derivatives, optimization of functions of more than one variable, Lagrange multipliers, polar, cylindrical, spherical coordinates. Time permitting, we may look at multiple integrals, line integrals, surface integrals, divergence theorem and Stokes theorem.

Exam 2 is tentatively set for Nov. 14.

**Week 14 (Nov. 19-23) is Thanksgiving Break**

**Week 16 (Dec. 3-7):** Modeling with differential equations. Review