

MA3335 - Syllabus

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Office hours: T, Th, 3 PM -4:30 PM (or by appointment)

Prerequisites: Math 2433.

Course Description: This course is an introduction to the theory of vector fields in 2 and 3 dimensions and some associated differential geometry. It is primarily a service course for students majoring in physics and engineering. The hope is that the course will cover the mathematical background required for classical continuum theories and electromagnetic field theory.

Textbook:

“Introduction to Vector Analysis”, 7th Ed., by H. F. Davis and A. D. Snider, Wm. C. Brown, Publ., 1998.

Class tentative topics:

1. Introduction to vectors in the plane and in space; scalar and vector products, parametric equations of lines and planes, length, area and volume of boxes and tetrahedra.
2. Vector-valued functions of a scalar variable and the analysis of curves in space. Tangents, normals and curvature.
3. Vector fields in Cartesian coordinates, their field lines, gradients and vector differential operators, (div, grad, curl and Dv = matrix derivative of the field v). The scalar and vector Laplacian.
4. Spherical and cylindrical polar coordinate systems, unit vector fields (moving frames) and vector differential operators in these systems.
5. Line, surface and volume integrals, characterization of irrotational fields.
6. The Divergence Theorem and Stokes' Theorem in 3 dimensions and associated theorems.

Grading:

Suggested Homework will be assigned every Tuesday but *will not* be collected. Every Tuesday a 20 minutes quiz test will be administered from the suggested homework problems. There will be two in class midterms (dates to be announced) and a final in class comprehensive exam.

The grade will be calculated as follows: 20% Quiz average, 25% Midterm 1, 25% Midterm 2, 30% Final Exam.

UH Counseling and Psychological Services (CAPS) Statement

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (www.uh.edu/caps) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. No appointment is necessary for the "Let's Talk" program, a drop-in consultation service at convenient locations and hours around campus. http://www.uh.edu/caps/outreach/lets_talk.html