MATHEMATICS 10A

CALCULUS OF SEVERAL VARIABLES – I

Text: *Basic Multivariable Calculus*, by J. E. Marsden, A. J. Tromba and A. Weinstein

Instructor: Zhuang-dan Daniel Guan
Class: MWF 3.10–4.00pm, Geol. 1408
First Class: Sept. 26, Friday
Office Hours: TTh 1.30–3.00pm, Surge 237.

This course covers the basics of differential calculus for functions of two and three variables, including the vector approach to Euclidean geometry, partial derivatives, gradients, the chain rule in several variables, Taylor polynomial approximations in several variables, and basic constructions associated to vector fields.

Outline for Mathematics 10A

We plan to cover the following sections and expect your eager and sincere participations:

TOPICS   SUGGESTED NO. OF WEEKS' COVERAGE

Partial differentiation 4
    (§§ 2.1–2.6)

        Graphs of level surfaces, partial derivatives and continuity, differentiability, the derivative matrix and tangent planes, the chain rule, gradients and partial derivatives, implicit differentiation.

Higher derivatives and extrema 3
    (§§ 3.1–3.5)

        Higher order partial derivatives, Taylor's Theorem, maxima and minima, second derivative test, constrained extrema and Lagrange multipliers.

Vector valued functions 2
    (§§ 4.1–4.4)

        Acceleration, arc length, vector fields, divergence and curl.

Tests: Midterm on the seventh week; Final: Dec 13, 3–6pm.
Homework: Homework assigned during each Friday class is due to following Friday.

    Homework is important, it counts for 10% of the total credit.

Quizzes: There will be two quizzes in the discussion sections, one on the fourth week and the other on the ninth week.

    Quizzes are also important, they count for another 10% of the total credit.

Midterm counts 30%, and Final counts 50%.