MATHEMATICS 10A-001: CALCULUS OF SEVERAL VARIABLES I

Text: *Vector Calculus*, by S. Colley, 4th edition

Instructor: Zhuang-dan Daniel Guan
Class: TTh 9.40am–11.00am, OLMH 1208
First Class: Oct. 2, Thursday
Office Hours: T 2.00–3.00pm, Surge 237 or by appointment.

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

Vectors 2
(§§ 1.1–1.5)

Vectors, Euclidean spaces, dot product, cross product, planes.

Partial differentiations 2.5
(§§ 2.1–2.5)

Graphs of functions and level surfaces,n limit and continuity, partial derivatives without differentiability, the chain rule.

Vector valued functions 2.5
(§§ 2.6, 3.1–3.4)

Directional derivatives and gradients, parameterized curves, arclength, vector fields, divergence and curl.

Maxima and minima 2
(§§ 4.1–4.3)

Differentiation and tangent plane, Taylor's Theorem, extrema, Lagrange multipliers.

Tests: Midterm around Nov. 13; Final: Dec. 16, Tuesday 8.00am–11.00am.
Homework: Homework assigned during each lecture is due in about a week. We shall use WebWorK. Homework is important, it counts for 20% of the total credit.
Quizzes: There will be four quizzes in the discussion sections in the second, fourth, eighth and tenth week. Quizzes are also important, they count for another 20% of the total credit. Midterm counts 20%, and Final counts 40%. **Attendances are required.** There might be some pop-up quizzes in the lectures. We might use clickers and there will be 1% bonus or deduction for participations.