

MATHEMATICS 10A-001: CALCULUS OF SEVERAL VARIABLES I

Text: *Vector Calculus*, by S. Colley

Instructor: Zhuang-dan Daniel Guan

Class: TTh 11.10am–12.30pm, OLMH 1208

First Class: Jan. 4, Tuesday

Office Hours: F 1.00–2.00pm, 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.

Attendances are required.

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, 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 on the seventh week (Feb. 17); Final: Mar. 14, Monday 8.00am–11.00am.

Homework: Homework assigned during each lecture is due in about a week. We shall use Webassign. Homework is important, it counts for 10% of the total credit.

Quizzes: There will be three quizzes in the discussion sections in the third, fifth and ninth week. Quizzes are also important, they count for another 15% of the total credit. There might be some pop quizzes in the Lecture.

Midterm counts 30%, and Final counts 45%. **Attendances are required.**