

# MATHEMATICS 10B

## CALCULUS OF SEVERAL VARIABLES – II

**Text:** *Vector Calculus*, by J. E. Marsden and A. J. Tromba

**Instructor:** Zhuang-dan Daniel Guan

**Class:** MWF 3.10–4.00pm, Spr. 2355

**First Class:** Jan. 3, Monday

**Office Hours:** Th 2.00–3.00pm or by appointment, Surge 237.

This course covers the basics of integral calculus for functions of two and three variables, including double and triple integration, changes of variables, line and surface integrals, and the theorems of Green, Stokes and Gauss in vector calculus.

### Outline for Mathematics 10B

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

TOPICS	SUGGESTED NO. OF WEEKS' COVERAGE
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Multiple integration ..... 3 (§§ 5.1–5.5)	
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Computation of volumes and Cavalieri's principle, double integrals over rectangles and more general regions, triple integrals.

The change of variables formula and application of integrals ..... 1 (§§6.1–6.4)	
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Change of variables, polar coordinates, spherical coordinates, improper integrals.

Integrals over paths and surfaces ..... 2 (§§ 7.1–7.6)	
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Line integrals, parametrized surfaces, surface area, surface integrals, flux of a vector field.

Integral theorems of vector analysis ..... 3 (§§ 8.1–8.6)	
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Theorems of Green, Stokes and Gauss; path independence of line integrals and the Fundamental Theorem of Calculus.

**Tests:** Midterm on the seventh week; Final: Mar. 19, 8–11am.

**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%.