

Mathematics 23a, Fall 2005

Theoretical Linear Algebra and Multivariable Calculus I

Catalog Number: 2486

Exam Group: 4

COURSE INFORMATION

- **Instructor:**

Alberto De Sole
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- **Course Assistants:**

1. Gerardo Con Diaz
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2. Samuel Cross
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3. Sam Lewallen
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4. Andrew Laitman
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5. Alexandra Kjuchukova
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- **Textbooks:**

Charles W. Curtis, *Linear Algebra*, Springer (mostly for math 23a)
C. H. Edwards Jr., *Advances calculus of several variables*, Dover
(mostly for math 23b)

- **Meeting times:**

Lectures: M., W., F., 11–12 am, in Science Center E
Instructor's office hours: M.,W., 12–1 (& by appointment)
Problem sessions: *TBA*

1. Tuesday, 7-8 pm, Sc. Ctr. 507
2. Wednesday, 4-5 pm, Sc.Ctr. 103b
3. Wednesday, 8-9 pm, Sc.Ctr. 310
4. Thursday, 6-7 pm, Sc.Ctr. 411

5. Thursday, 8-9 pm, Sc.Ctr. 408

• **Course Web Page:**

<http://www.courses.fas.harvard.edu/~math23a/>

Course announcements, homework assignments, and homework solution sets will all be posted here.

Course description (valid both for math 23a and 23b)

A rigorous treatment of linear algebra and the calculus of functions of n real variables.

Topics include: Construction of number systems. Real numbers and other fields. Finite and infinite-dimensional vector spaces. Linear transformations. Eigenvalues and eigenvectors. Multilinear forms. Determinants. Systems of linear differential equations. Topological structure of Euclidean spaces. Inner products, and norms. Functions of several real variables. Differentiation and integration of functions of several variables. The classical theorems of vector analysis.

This course is designed for students with a strong background in one-variable Calculus, interested in theoretical mathematics.

Formal course requirements

Problem sets: Weekly problem sets will be handed out. You are encouraged to work in groups on these problem sets. However, each of you must write up the solutions alone. Late problem sets will be penalized (by subtracting %10 of the grade for each day they are late) unless authorized by the instructor.

Midterm Exams: There will be two 1-hour midterm exams, during class hours, on the following days:

Monday, October 17 , Monday, November 21

Final Exam: There will be a 3-hours final examination. It is scheduled by the Registrar for the following day:

Tuesday, January 24

Grading policy: Problem sets: 30%, mid-term exams: 30%, final exam: 40%