

## Mathematics 60 – Linear Algebra

Claremont McKenna College, Spring 2009

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Office Hours: TTh 10:00-11:50 AM and by appt.

The text for this course is Curtis' *Linear Algebra: An Introductory Approach*. Class is from 10:00 to 10:50 AM in RN 105 every Monday, Wednesday and Friday. Regular attendance is encouraged.

Topics we will cover in this course include number fields, proof by induction, vector spaces, subspaces, linear dependence and independence, basis and dimension, row equivalence of matrices, systems of linear equations, matrix algebra, inner product spaces, determinants, eigenvalues and eigenvectors, invariant subspaces, canonical forms, dual spaces, bilinear forms, tensor products and applications.

Attached is an approximate course calendar showing which sections I intend to cover on which days. Each day, I will give a lecture explaining the concepts and showing examples from that day's section, which you should have already read; then, before the next class, you should work a few problems from that day's section in the book and read the next assigned section.

**There is no way to learn linear algebra without doing the problems and reading the sections in the book.** On the other hand, if you do the required reading and problems (and at least a few practice problems from the book), pay attention in the lectures, and make sure to ask questions when things don't make sense (my office hours are for **your** questions!), you have every reason to expect success in the course.

Grading will be as follows:

- 30%** - weekly take-home assignments
- 40%** - two midterms
- 30%** - final exam (**Monday, May 10 9:00 AM - 12:00 PM**)

My grading policy is explained on my website, which you should read carefully. In summary, we will use a 5-point scale for grading problems, designed to ensure uniform and fair grading.

30% of your grade will come from weekly take-home assignments. These will be handed out in class and also posted to my website, in case you need a new copy. We will drop the lowest homework score when determining the final grade.

The midterms will have around eight problems plus some bonus problems. The final will be cumulative, will have around sixteen problems plus some bonus problems and will be given in RN 105 on Monday, May 10 from 9:00 AM to 12:00 PM. Before each exam, I will post a practice exam and separate solutions page to the above-listed website. These practice exams can be helpful in identifying weaknesses in your understanding of the material. However, the fact that a certain type of problem does not show up on the practice exam does **not** mean that a problem of that type will not show up on the actual test. In particular, doing the practice exam is not a substitute for working the practice problems throughout the semester.

Since late take-home assignments will not be accepted, we will drop the lowest homework score. Make-up exams will be permitted only with a valid reason and should be scheduled ahead of time. Calculators are permitted but are neither required nor necessarily helpful – you cannot simply write a number or formula and expect to receive credit, as your grade is based on your *explanation* of your answer, not just the answer itself. Cheating in any form will not be tolerated.

You are encouraged to come to my office hours with any questions or concerns you might have; my office hours are there for you. You can also send me questions through email at [Sam.Nelson@cmc.edu](mailto:Sam.Nelson@cmc.edu), via AOL or Yahoo! instant messengers at [ProfSamNelson](http://ProfSamNelson), or via SMS or Facebook.

## Math 60 Approximate Calendar, Spring 2009

### January

M	W	F
	20 Intro	21 L1
25 L2	26 L3	29 L4

### February

M	W	F
1 L5	3 L6	5 L7
8 L8	10 L9	12 L10
15 L11	17 L12	19 L13
22 L14	24 L15	26 Review

### March

M	W	F
1 Mid 1	3 L16	5 L17
8 L18	10 L19	12 L20
15 Break	17 Break	19 Break
22 L21	24 L22	26 Break
29 L23	31 L24	

### April

M	W	F
		2 L25
5 L26	7 L27	9 L28
12 L29	14 L30	16 Review
19 Mid 2	21 L31	23 L32
26 L33	28 L34	30 L35

### May

M	W	F
3 L36	5 Review	

**FINAL EXAM:**  
**Monday, May 10 9:00 AM - 12:00 PM**

### Lecture Topics

L1	Fields	L13	Linear transformations	L25	Diagonalization
L2	Induction	L14	Linear transformations II	L26	Eigenspaces
L3	Vector spaces	L15	Matrix algebra	L27	Invariant subspaces
L4	Subspaces	L16	Matrix algebra II	L28	Triangular form
L5	Linear dependence	L17	Groups	L29	Canonical Forms
L6	Basis	L18	Inner Products	L30	Bilinear forms
L7	Row equivalence	L19	Inner products II	L31	Duality
L8	Finite dim'l spaces	L20	Bonus	L32	Quotient spaces
L9	Finite dim'l spaces II	L21	Determinants	L33	Direct sums
L10	Systems of linear equations	L22	Determinants II	L34	Tensor Products
L11	Homogeneous systems	L23	Determinants III	L35	Applications
L12	Affine spaces	L24	Determinants IV	L36	Applications