

# MAT 211 : Introduction to Linear Algebra

## LEC 2 , Spring 2005 , StonyBrook

**Instructor:** (Lec2 : MW 6:50-8:10pm P113)

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Office: 2-115 Math Tower

Office hours: M 5:20-6:50, W 5:20-5:50 in my office and W 5:50-6:50 at MLC

**Course Grader:** Jihyeon Jessie Yang (jessie@math.sunysb.edu)

Office: 2-112 Math Tower , Office hours: Tu 12:00-12:55 MLC

**Text:** Linear Algebra with Applications by Otto Bretscher, 3rd edition

**Homework:** Homework will be posted to the web each week. To be handed in on wednesday of the following week, at the beginning of the class. We expect you to staple your homework whenever it consist of more than a single page.

**Examinations:** There will be two midterm examinations and a final examination

Final examination(note the change) : **Monday May 16th at 8:00pm-10:30** (Comprehensive)

**Grades:** Grades will be assigned on the following basis:

Homework 25%, Midterms 20% each, Final 35%.

**Web page:** The course web page is <http://www.math.sunysb.edu/~kalafat/211/>.

**Calendars:** Academic , Monthly

### SYLLABUS , HOMEWORK and ANNOUNCEMENTS

**Note:** If you have a physical, psychological, medical or learning disability that may affect your ability to carry out assigned course work, I urge you to contact the staff in the Disabled Student Services office (DSS), Room 133 Humanities, 632-6748/TDD. DSS will review your concerns and determine, with you, what accomodations are necessary and appropriate. All information and documentation of disability is confidential.

The syllabus of the course will actually go through the contents of the first 7 chapters of the textbook :

### Syllabus :

#### Linear Equations

1. Linear Systems, Matrices, Vectors(\*) and Gauss-Jordan Elimination : 1.1 , 1.2
2. On the Solutions of Linear Systems , Matrix Algebra : 1.3

#### Linear Transformations

3. Linear Transformations and their Geometry : 2.1 , 2.2
4. Inverse of a Linear Transformation : 2.3
5. Matrix Products : 2.4

#### Subspaces of $\mathbb{R}^n$ and Their Dimensions

6. Image and Kernel : 3.1
7. Bases and Linear Independence : 3.2
8. Dimension : 3.3

**MIDTERM 1** , Wednesday 2th March , See below for details

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9. Coordinates : 3.4

#### Linear/Vector Spaces

10. Linear Spaces or Vector Spaces : 4.1
11. Linear Transformations and Isomorphisms : 4.2
12. Coordinates in a Linear Space : 4.3

#### Orthogonality and Least Squares

13. Orthogonal Projections and Orthonormal Bases : 5.1
14. Gram-Schmidt Process and QR Factorization : 5.2
15. Orthogonal Transformations and Matrices : 5.3
16. Inner Product Spaces : 5.5

**MIDTERM 2** , Wednesday 13th April , See below for details

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#### Determinants

17. Introduction to determinants : 6.1
18. Properties of determinants, Cramers Rule, Adjoint&Inverse of a matrix : 6.2, part of 6.3

#### Eigenvalues and Eigenvectors

19. Eigenvalues : 7.2
20. Eigenvectors : 7.3
21. Diagonalization : 7.4

**FINAL** , Monday May 16th at 8:00pm-10:30, See below for details

(\*)If you want to review vectors and their algebra, you may consult to the appendix at the end of the book

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#### Homework:

**HW01** : 1.1-7,9,11,37 1.2-9,11,13,18,31,35 1.3-4,19,37,55,57,59

**HW02** : 2.1-5,8,10,42 2.2-6,7,8,26,28 2.3-5,11

**HW03** : 2.3-7,13,19,31 2.4-3,7,12,27,40

**HW04** : 3.1-5,10,13,15,24,34,42 3.2-6,8,17,19,24,25,28,31,33

**HW05** : 3.3-15,19,20,25,28 3.4-15,19,21,27,55,56,59

**HW06** : 4.1-24,27,35,51 4.2-53,54,55,58,59,60

**HW07** : 4.3-13,16,21,27,28,47,55,63 5.2-7,13

**HW08** : 5.1-11,27 5.2-21,27 5.3-35,40 5.5-5,10,11,20,23,27

**HW09** : 6.1-9,37,39 6.2-4,9,17,24 6.3-22,23,25,30,31

**HW10 : 7.1-38 7.2-3,9,11 7.3-3,15 7.4-7,9,13,15,17,19,49**  
due **monday , april 9th**, at the beginning of the class

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### **MIDTERM 1 INSTRUCTIONS:**

- [Here](#) are some practise problems for the midterm, try to study till you feel comfortable with those
- Midterm 1 covers the first 3 Chapters (3.4 excluded)
- There will be no new HW assignment on the week of midterm
- Midterm is going to take place in class , P113
- You're supposed to be ready in class at 6:45pm
- No calculators, books and notes are allowed. If you have your book or notes with you, they should stay in a bag during the exam, not to be seen from outside.

### **MIDTERM 2 INSTRUCTIONS:**

- [Here](#) are some practise problems for the midterm, try to study till you feel comfortable with those
- Midterm 2 covers the sections 3.4 to 5.3, and 5.5
- There will be no new HW assignment on the week of midterm
- Midterm is going to take place in class , P113
- You're supposed to be ready in class at 6:45pm
- No calculators, books and notes are allowed. If you have your book or notes with you, they should stay in a bag during the exam, not to be seen from outside.
- Solutions to the midterm: [p1](#), [p2](#), [p3](#), [p4](#)

### **FINAL INSTRUCTIONS:**

- [Here](#) are some practise problems for the final, try to study till you feel comfortable with those
- Final is cumulative with emphasis on the sections 5.5 and on.
- There'll be a problem session on Friday at 4:30 this week, in P131. Come with questions
- Wednesday and Friday afternoons i'll be around for your questions, especially in the office hour.
- **Exam Location:** Usual classroom , P113
- You're supposed to be ready in the exam place at 7:55pm
- No calculators, books and notes are allowed. If you have your book or notes with you, they should stay in a bag during the exam, not to be seen from outside.

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