Math 221: Vectors and Matrices
Section 1: Tuesday-Thursday, 10:30 – 11:50am, Exley 121
Fall 2015

Instructor: Dr. Vince Guingona
      Email: vguingona@wesleyan.edu
      Office: 649 Exley Science Center
      Office Hours: Wednesday 1-3pm, Thursday 3-4pm, and by appointment

Course Assistant: Minchul Shin
      Email: mshin02@wesleyan.edu
      Recitation: Tuesdays, 8 – 9pm, 638 Exley Science Center
      Office Hour: Wednesdays 4:15 – 5:15pm, 113 Exley Science Center

Teaching Assistant: Mostafa Mirabi
      Office Hours: Tuesdays, 4:30 – 6:30pm, 113 Exley Science Center

Textbook: *Elementary Linear Algebra*, Second Edition by Spence, Insel, and Friedberg.

Moodle: All course material for Math 221 will be online on Moodle.

Introduction: Welcome to Math 221, *Vectors and Matrices*! In this class, we will learn the basics of linear algebra, which is the study of vectors and matrices (hence the title). We will not follow the text page by page, but I do aim to cover most of the material from the first five chapters. To quote the course description:

> *This is a course in the algebra of matrices and Euclidean spaces that emphasize the concrete and geometric. Topics to be developed include solving systems of linear equations; matrix addition, scalar multiplication, and multiplication; properties of invertible matrices; determinants; elements of the theory of abstract finite dimensional real vector spaces; dimension of vector spaces; and the rank of a matrix. These ideas are used to develop basic ideas of Euclidean geometry and to illustrate the behavior of linear systems. We conclude with a discussion of eigenvalues and the diagonalization of matrices.*

Homework: Homework will be assigned weekly and will typically consist of a list of problems from the textbook. Homework will be due on Thursdays by 5pm, to be turned into the box outside my office. Assignments may also be given to me in class on the day that they are due. Late homework will not be accepted. You are permitted to work on the homework in groups, but each person must write up and turn in her or his own solutions. Please show all of your work on each problem. Homework will be worth 20% of your total grade.

Exams: There will be two midterms and one final exam. The midterms will take place during class and will last the full 80 minutes. The first midterm is on **Thursday, October 15ᵗʰ** and the second midterm is on **Thursday, November 19ᵗʰ**. The night before each midterm, I will hold a review session, whose time and location will be determined during class. Each midterm will be worth 20% of your total grade. The final

will cover all the material from the entire course, though it will focus on the material covered after the second midterm. The final will take place on **Saturday, December 19th, from 9am to noon**. The final will be worth 40% of your total grade. All exams are closed-book exams; please show all of your work. **No calculators will be allowed on exams.**

Grading: Your grade will be calculated with the following breakdown:

Homework : 20% – Midterm 1 : 20% – Midterm 2 : 20% – Final : 40%.

Your letter grade will be given by the following chart:

Grade	Letter
97 – 100%	A+
93 – 96.99%	A
90 – 92.99%	A-
87 – 89.99%	B+
83 – 86.99%	B
80 – 82.99%	B-
77 – 79.99%	C+
73 – 76.99%	C
70 – 72.99%	C-
67 – 69.99%	D+
63 – 66.99%	D
60 – 62.99%	D-
57 – 59.99%	E+
53 – 56.99%	E
50 – 52.99%	E-
0 – 49.99%	F

Tentative Class Schedule:

Week	Dates	Sections	Topics
1	9/8, 9/10	1.1, 1.2	Matrices and Vectors
2	9/15, 9/17	1.2, 1.3	Linear Combinations
3	9/22, 9/24	1.4	Gaussian Elimination
4	9/29, 10/1	1.6, 1.7, 2.1, 2.2	Spans, Linear Dependence, and Matrix Multiplication
5	10/6, 10/8	2.3, 2.4, 2.7	Inverse Matrices and Linear Transformations
6	10/13	2.8	Composition of Linear Transformations
	10/15		Midterm 1
7	10/20, 10/22	3.1, 3.2	Cofactor Expansion and Properties of Determinants
8	10/29	4.1	Subspaces
9	11/3, 11/5	4.2, 4.3	Basis, Dimension, and Subspace Dimension
10	11/10, 11/12	4.4, 4.5	Coordinate Systems and Matrix Representations of Linear Operators
11	11/17	5.2	Characteristic Polynomials
	11/19		Midterm 2
12	11/24	5.5	Eigenvalues
13	12/1, 12/3	6.1, 6.2	Geometry of Vectors and Orthogonal Vectors
14	12/8, 12/10	6.3, 6.4	Orthogonal Projections and Least-Squares Approximation

Getting Help: This is a fast-paced course, so you may occasionally need assistance with the material covered. There are several resources outside of the classroom to help you with this:

- **Office Hours:** I will hold office hours on Wednesdays from 1 to 3pm and on Thursdays from 3 to 4pm. I am also available at other times, but you will need to make an appointment via email. Feel free to ask me any questions you have relating to the course during office hours.
- **Recitations:** The course assistant, Minchul Shin, will hold recitation sessions weekly (at a time and location to be determined). He will go over homework and answer other questions you may have about the material.
- **Math Workshop:** The Math Workshop is located in the Science Library in the main floor conference room (Room 133A). It is staffed with undergraduate and graduate assistants who can help you with questions relating to homework and lectures.
- **Review Sessions:** Before each midterm and final, I will hold a review session to answer questions about the material. These will be scheduled in class about a week before the exam.

Special Accommodations Policy: According to official policy:

Wesleyan University is committed to ensuring that all qualified students with disabilities are afforded an equal opportunity to participate in and benefit from its programs and services. To receive accommodations, a student must have a documented disability as defined by Section 504 of the Rehabilitation Act of 1973 and the ADA Amendments Act of 2008, and provide documentation of the disability. Since accommodations may require early planning and generally are not provided retroactively, please contact Disability Resources as soon as possible. If you believe that you need accommodations for a disability, please contact Dean Patey in Disability Resources, located in North College, Room 021, or call 860-685-5581 for an appointment to discuss your needs and the process for requesting accommodations.

If you require accommodations, please make an appointment with me during the first two weeks of class so that we can make the appropriate arrangements.

Wesleyan Honor Code: Please follow the Wesleyan Honor Code (*id est*, don't cheat!). For each homework and exam, the pledge states:

In accordance with the Honor Code, I affirm that this work has been completed without improper assistance.

See the Student Handbook for more information.

Conclusion: Thanks for signing up for my course. I hope we have an enjoyable semester together!

Last Updated: October 8, 2015