MATH 160.03: Matrix Algebra / Linear Algebra

Fall 2019, TuTh 8:25-9:40 PM, West Building W224

Instructor: Khalid Shafiq **Email**: Khalid.shafiq98@myhunter.cuny.edu

Office HE924

Office Hours: The following office hours are tentative – I will finalize office hours after the first week.
Tuesday & Thursday 8:00:-8:25 PM HE924
Please do not hesitate to make an appointment if my posted office hours don't work for you.

Class website: https://github.com/kshafiq/MATH160

Prerequisite: Math 125 (PreCalculus) or appropriate score on the placement exam.

Textbook: *Linear Algebra with Applications* by Stephen Leon, 9th Edition Pearson Publishers, ISBN #: 0321962214

Syllabus

1. **MATRICES AND SYSTEMS OF EQUATIONS (SECTIONS: 1.1, 1.2,1.3,1.4, 1.5)**
   - System of linear equations
   - Row echelon form
   - Matrix algebra
   - Elementary matrices
2. **DETERMINANTS (SECTIONS: 2.1, 2.2, 2.3)**
   - The determinant of a matrix
   - Properties of determinants
3. **VECTOR SPACES (SECTIONS: 3.1,3.2,3.3,3.4)**
   - Definition and examples
   - Subspaces
   - Linear independence
   - Basis and dimension
4. **Linear Transformations (SECTIONS: 4.1)**
   - Definition, and few examples of matrix representations of Linear Transformations
5. **ORTHOGONALITY (SECTIONS: 5.1)**
6. The scalar product in R^n
7. **EIGENVALUES (SECTIONS: 6.1)**
   - Eigenvalues of a square matrix. The characteristic polynomial and the characteristic equation. Eigenvectors; Finding the eigenvalues and the corresponding eigenvectors of a matrix.

Learning Outcomes:
Matrix Algebra / Linear Algebra is an area of mathematics that deals with the properties and applications of vectors, matrices, and other related mathematical structures. student will be able to:

- Solve systems of linear equations using Gaussian elimination and Gauss-Jordan Elimination
- Perform operations using matrices and apply matrices in real-world applications
- Calculate determinants, understand their properties and some applications
- Define vector spaces, vector subspaces, and understand their properties
- Find length and the dot product in R^n
- Calculate Eigenvalues and Eigenvectors

Homework
Homework is assigned from each section. It is absolutely necessary to do these homework problems to be successful in the course. Homework sets will be collected and will be worth 15% of your grade.

Quizzes
There will be periodic short quizzes based on readings, homework, classwork and/or other assigned tasks. The quizzes will collectively account for 5% of your final grade.

Makeups
Quizzes: There will be no makeup for missed quizzes, regardless of reason.
Homework: Past-due assignments will not be accepted except in rare circumstances, provided the student receives prior consent from the instructor.
Exams: Make-up exams will not be given except in the case of a documented emergency.

Grading Policy:
There will be 2 in-class mid-term exams and a final exam. The dates of the mid-term exams and final will be announced in class. ** The final exam date and time is set by the registrar's office*

Quizzes	5%
Homework	15%
First Mid-Term	20%
Second Mid-Term	20%
Final Exam	40%

Attendance:
Attendance will be taken each class day. Though attendance does not count towards your grade, you are expected to attend each class.

Tutoring
Drop-in tutoring, table-tutoring, and audiovisual materials are available at The Dolciani Mathematics Learning Center, Silverstein Success Center 7th floor Hunter East.

Calculators
No scientific calculator is permitted for exams.

Academic Integrity:
Hunter College of The City University of New York regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures.

Disability:
In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical and/or Learning) consult the Office of AccessABILITY located in Room E1124 to secure necessary academic accommodations. For further information and assistance please call (212-772-4857)/TTY (212-650-3230).

Hunter College Policy on Sexual Misconduct:
In compliance with the CUNY Policy on Sexual Misconduct, Hunter College reaffirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationships. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College.