NEW YORK CITY COLLEGE OF TECHNOLOGY
The City University of New York

DEPARTMENT:	Mathematics
COURSE:	MAT 2580
TITLE:	Introduction to Linear Algebra
DESCRIPTION:	An introductory course in Linear Algebra. Topics include vectors, vector spaces, systems of linear equations, linear transformations, properties of matrices, determinants, eigenvalues, and eigenvectors.
TEXT:	Elementary Linear Algebra: Applications Version 11th Edition, Howard Anton, Chris Rorres. Wiley 2014
CREDITS:	3 (3 class hours)
PRE/CO-REQUISITES:	MAT 1575 (Calculus II)

Prepared by Professors ElHitti, Ghezzi, Singh, 2016

A. Testing Guidelines:

The following exams should be scheduled:

1. A one session exam at the end of the First Quarter.
2. A one session exam at the end of the Second Quarter.
3. A one session exam at the end of the Third Quarter.
4. A one session Final Examination.

B. A graphing calculator is required. We recommend a calculator which can compute eigenvalues.

Course Intended Learning Outcomes/Assessment Methods

Learning Outcomes	Assessment Methods
1. Solve systems of linear equations using matrices.	Classroom activities and discussion, homework, exams.
2. Identify and use vector properties (spaces, subspaces, bases, inner product).	Classroom activities and discussion, homework, exams.
3. Identify properties of matrices (invertibility, eigenvalues, eigenvectors).	Classroom activities and discussion, homework, exams.
4. Use computer technology to assist in the above.	Classroom activities and discussion, homework, exams.

General Education Learning Outcomes/Assessment Methods

Learning Outcomes	Assessment Methods
1. Gather, interpret, evaluate, and apply information discerningly from a variety of sources.	Classroom activities and discussion, homework, exams.
2. Understand and employ both quantitative and qualitative analysis to solve problems.	Classroom activities and discussion, homework, exams.
3. Employ scientific reasoning and logical thinking.	Classroom activities and discussion, homework, exams.
4. Communicate effectively using written and oral means.	Classroom activities and discussion, homework, exams.
5. Acquire tools for lifelong learning.	Classroom activities and discussion, homework, exams.
6. Utilize computer based technology in accessing information, solving problems and communicating.	Classroom activities and discussion, homework.

New York City College of Technology Policy on Academic Integrity

Students and all others who work with information, ideas, texts, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and at New York City College of Technology and is punishable by penalties, including failing grades, suspension, and expulsion. The complete text of the College policy on Academic Integrity may be found in the catalog.

MAT 2580 Introduction to Linear Algebra Text: Elementary Linear Algebra: Applications Version, 11th Edition, Howard Anton, Chris Rorres, Wiley 2014

*Homework problems which are best done with the use of technology are marked with T.

Session	Introduction to Linear Algebra	Homework
1	3.1 Vectors in 2-Space, 3-Space, and *n*-Space (p 131-140)	p 140: 1-11 odd, 17
2	3.2 Norm, Dot Product and Distance in $\mathbb{R}^n$ (p 142-148)	p 153: 1, 3, 7, 9, 11
3	3.3 Orthogonality (p 155-160)	p 162: 1-17 odd
4	1.1 Introduction to Systems of Linear Equations (p 2-8)	p 8: 1, 5-11 odd, 19
5	1.2 Gaussian Elimination (p 11-16)	p 22: 1-11 odd
6	1.2 Gaussian Elimination (p 17-22), Introduction to Technology	p 22: 13-19 odd, 23, 25, T1
7	1.3 Matrices and Matrix Operations (p 25-36)	p 36: 1-7 odd, 11, 13, 15, T1(a)
8	First Exam	
9	1.4 Inverses; Algebraic Properties of Matrices (p 39-49)	p 49: 1-7 odd, 11, 18, 23
10	1.5 Elementary Matrices and a Method for finding A^{-1} (p 52-58)	p 58: 1, 9, 11, 13, 15
11	1.6 More on Linear Systems and Invertible Matrices (p 61-66)	p 66: 1, 3, 9, 13, T1, T2
12	1.7 Diagonal, Triangular, and Symmetric Matrices (p 67-72)	p 72: 1, 3, 7, 9, 13, 17, 19, 21, 25
13	1.8 Matrix Transformations (p 75-81)	p 82: 1-19 odd, 27
14	2.1 Determinants by Cofactor Expansion (p 105-110)	p 111: 5, 15-21 odd, 27, 29, T1
15	2.2 Evaluating Determinants by Row Reduction (p 113-116)	p 117: 1-11 odd, 15, 17, 19, T1
16	2.3 Properties of Determinants; Cramer's Rule (p 118-122)	p 127: 2, 5, 6, 9-17 odd, 33, T1, T2
17	Second Exam	
18	4.1 Real Vector Spaces (p 183-189) 4.2 Subspaces (p 191-194)	p 190: 3, 5 p 200: 1
19	4.2 Subspaces (p 195-200)	p 200: 7, 8, 11, 12, 15
20	4.3 Linear Independence (p 202-207)	p 210: 1(a)(b), 2, 3, 7, 8, 9
21	4.4 Coordinates and Basis (p 212-219)	p 219: 1, 2, 7, 12, 13
22	4.7 Row Space, Column Space, and Null Space (p 237-246)	p 246: 3, 7, 9, 10, 11, 13(a), T1, T2
23	5.1 Eigenvalues and Eigenvectors (p 291-299)	p 300: 1, 3, 5, 7, 9, 11, 25, 27
24	5.2 Diagonalization (p 302-311)	p 311: 1, 3, 7, 9, 17, 20, 22
25	5.2 Diagonalization (continued, including Technology)	P 313: T1(a),(d)(e),(f), T2, T3 and p 300: T1
26	Third Exam	
27	6.3 Orthonormal Sets: Definition 1 and Example 1 (p 364) 7.1 Orthogonal Matrices (p 401-402) 7.2 Orthogonal Diagonalization (for 2x2 matrices) (p 409-411)	p 376 : 1 p 407: 1, 3, 5 p 416: 7, 8, 10
28	7.3 Quadratic Forms (p 417-427)	p 427: 1, 3, 4, 5, 6, T2
29	Review	
30	Final Examination	