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:	Linear Algebra and its Applications 4th Edition David C. Lay Addison Wesley.
CREDITS:	3 (3 class hours)
PRE/CO-REQUISITES:	MAT 1575

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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.

Learning Outcomes
for
MAT 2580 Introduction to Linear Algebra

1. Students will be able to solve systems of linear equations using matrices.

2. Students will be able to identify and use vector properties (spaces, subspaces, bases, inner product).

3. Students will be able to identify properties of matrices (invertibility, eigenvalues, eigenvectors).

4. Students will be able to use computer technology to assist in the above.

Gen Ed Learning Outcomes
for
MAT 2580 Introduction to Linear Algebra

Students will be able to:

- Gather, interpret, evaluate, and apply information discerningly from a variety of sources.
- Understand and employ both quantitative and qualitative analysis to solve problems.
- Utilize computer based technology in accessing information, solving problems and communicating.
- Employ scientific reasoning and logical thinking.
- Communicate effectively using written and oral means.
- Acquire tools for lifelong learning.

Assessment

The learning outcomes will be assessed using classroom discussion, homework, group projects and exams.

Mathematics Department Policy on Lateness/Absence

A student may be absent during the semester without penalty for 10% of the class instructional sessions. Therefore,

If the class meets:	The allowable absence is:
1 time per week	2 absences per semester
2 times per week	3 absences per semester

Students who have been **excessively absent and failed the course at the end of the semester will receive either**

the WU grade if they have attended the course at least once. This includes students who stop attending without officially withdrawing from the course.

the WN grade if they have never attended the course.

In credit bearing courses, the WU and WN grades count as an F in the computation of the GPA. While WU and WN grades in non-credit developmental courses do not count in the GPA, the WU grade does count toward the limit of 2 attempts for a developmental course.

The official Mathematics Department policy is that two latenesses (this includes arriving late or leaving early) is equivalent to one absence.

Every withdrawal (official or unofficial) can affect a student's financial aid status, because withdrawal from a course will change the number of credits or equated credits that are counted toward financial aid.

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:** Linear Algebra and its Applications, 4th ed., by Lay

*Homework problems which are best done with a mathematics application (such as Matlab), or a calculator with matrix functions (such as the TI 83+) are marked with an M. If resources are not available, they may be considered optional problems. The letter W indicates additional information provided at http://wps.aw.com/aw_lay_linearalgebra_4/

Session	Introduction to Linear Algebra	Homework
1	1.1 Systems of Linear Equations p.2-9	p. 11 ex. 1-25 odd, 27, 29, 30, 33, 34
2	1.2 Row Reduction and Echelon Forms p.12-21	p. 21 ex.1-31 odd, 34M
3-4	1.3 Vector Equations p.24-31	p. 32 ex.1-25 odd, 26, 27M, 28M, 29-31all, 33.
5	1.4 The Matrix Equation Ax = b p.34-40	p. 40 ex.1-15 odd, 19-36 all, 37M, 39M, 41M
6	1.5 Solution Sets of Linear Systems p.43-46	p. 47 ex.1-21 odd, 23, 24, 26, 27-37 odd
7	1.7 Linear Independence p.55-60	p. 60 ex.1-29 odd, 31, 33-39 all, 41M
8	1.8 Introduction to Linear Transformations p.62-68	p. 68 ex.1-21 odd, 22, 23-35odd, 37M, 38M, 39M
9	**First Examination**	
10	1.9 (Optional) The Matrix of a Linear Transformation p.70-77	p. 78 ex.1-23 odd, 29, 30
11	2.1 Matrix Operations p.92-100	p. 100 ex.1-27 odd, 37M, 40M, 41M
12	2.2 The Inverse of a Matrix p.102-109	p. 109 ex.1-23 odd, 31, 33, 35, 37, 38
13	2.3 Characterizations of Invertible Matrices p.111-114	p. 115 ex.1-7 odd, 9M, 13-31 odd, optional 33, 34
14-15	2.8 Subspaces of $\mathbb{R}^n$ p.146-150	p. 151 ex.1-11 all,15-33 odd, 37M
16	**Second Examination**	
17	3.1 Introduction to Determinants p.164-167	p. 167 ex. 1-13 odd , 19, 21, 23, 41, 44M, 46M
18-19	3.2 Properties of Determinants p.169-175	p. 175 ex. 1-7 odd, 15-20 all, 21, 25, 27, 28, 29, 31, 32, 35
20-21	5.1 Eigenvectors and Eigenvalues p.266-271	p. 271 ex.1-21 odd, 22, 23-33 odd, 37M
22	5.2 The Characteristic Equation p.273-279	p. 279 ex.1-27odd,28M, 30M
23	5.3 Diagonalization p.281-286	p. 286 ex.(W) 1-21 odd, 22, 23, 29, 31, 33M
24	**Third Examination**	
25	6.1 Inner Product, Length, and Orthogonality p.330-336	p. 336 ex. 1-19 odd, 20, 23, 24, 25
26	6.2 Orthogonal Sets p.338-344	p. 344 ex. 1-23 odd, 24, 27-30 all
27	4.1 Vector Spaces and Subspaces p.190-195	p. 195 ex. (W) 1-3 all, 9-17 odd
28	7.2 Quadratic Forms p.401-406	p. 406 ex. 1-9 all, 11, 17M, 23-26 all
29	**Review**	
30	**Final Examination**	