



THE COLLEGE OF SCIENCE
AND LIBERAL ARTS

THE DEPARTMENT OF MATHEMATICAL SCIENCES

MATH 337: Linear Algebra *Summer 2020 Course Syllabus*

NJIT Academic Integrity Code: All Students should be aware that the Department of Mathematical Sciences takes the University Code on Academic Integrity at NJIT very seriously and enforces it strictly. This means that there must not be any forms of plagiarism, i.e., copying of homework, class projects, or lab assignments, or any form of cheating in quizzes and exams. Under the University Code on Academic Integrity, students are obligated to report any such activities to the Instructor.

COURSE INFORMATION

Course Description: Matrices, determinants, systems of linear equations, vector spaces, linear transformations, eigenvalues, eigenvectors, and related topics.

Number of Credits: 3

Prerequisites: MATH 112 with a grade of C or better or MATH 133 with a grade of C or better.

Course-Section and Instructors

Course-Section	Instructor
Math 337-450	Professor P. Ward

Office Hours for All Math Instructors: [Summer 2020 Office Hours and Emails](#)

Required Textbook:

Title	<i>Linear Algebra and its Applications</i>
Author	Lay
Edition	5th
Publisher	Pearson
ISBN #	978-0321982384

Withdrawal Date: Please see the [Summer 2020 Academic Calendar](#) for the last day to withdraw based on the summer session you are registered for.

COURSE GOALS

Course Objectives

- Learn about matrices, determinants, applications to solving linear system of equations, matrix factorization, eigenvalues and eigenvectors, Gram-Schmidt process.

Cover relevant applications in economics, science and engineering to illustrate the utility of learning these topics.

- Use mathematical software, in problem solving, to allow the solution of more complex problems and provide visualization of the same.

Course Outcomes

- Prepare students for further study in theoretical courses such as differential and difference equations and least squares analyses.
- To enable students to use linear algebra use for numerical solvability of many problems.
- Students are prepared for applying linear algebra to many practical applications in fields like economics, computer science, physics, engineering, archeology, demography, relativity, etc.

POLICIES

DMS Course Policies: All DMS students must familiarize themselves with, and adhere to, the **Department of Mathematical Sciences Course Policies**, in addition to official **university-wide policies**. DMS takes these policies very seriously and enforces them strictly.

Grading Policy: The final grade in this course will be determined as follows:

Homework and Quizzes	30%
Midterm Exam	35%
Final Exam	35%

Your final letter grade will be based on the following tentative curve.

A	90 - 100	C	60 - 69
B+	85 - 89	D	50 - 59
B	75 - 84	F	0 - 49
C+	70 - 74		

Online Attendance Policy: Instruction will be conducted online through the Canvas LMS, and will make use of both pre-recorded lectures and synchronous online discussions using WebEx. Attendance at all classes will be recorded and is **MANDATORY**. Please make sure you read and fully understand the **Math Department's Attendance Policy**. This policy will be strictly enforced.

Technology Requirements: Quizzes and exams will be proctored using Respondus LockDown Browser with Respondus Webcam Monitoring. The software is free to NJIT students and can be downloaded here: <http://www.respondus.com/lockdown/download.php?id=264548414>.

System requirements to run Respondus LockDown Browser can be found here:

<https://web.respondus.com/he/lockdownbrowser/resources/>. Note that Respondus LockDown Browser cannot be run on Chromebooks or mobile devices, and the use of a webcam (internal or external to the computer) will be required.

Homework Policy: Homework will be assigned through Canvas and may be collected on a weekly basis.

Quiz Policy: A short quiz based on homework and lecture will be given frequently. They may be announced or pop-quizzes given without prior warning.

Exams: There will be one midterm exam held during the semester and one comprehensive common final exam. Tentative exam dates are::

Midterm Exam	June 17, 2020
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Final Exam

July 13, 2020

Makeup Exam Policy: To properly report your absence from a midterm or final exam, please review and follow the required steps under the DMS Examination Policy found here:

- http://math.njit.edu/students/policies_exam.php

Cellular Phones: All cellular phones and other electronic devices must be switched off during all class times.

ADDITIONAL RESOURCES

Math Tutoring Center: Located in the Central King Building, Room G11, See: ([Summer 2020 Hours](#))

Accommodation of Disabilities: Disability Support Services (DSS) offers long term and temporary accommodations for undergraduate, graduate and visiting students at NJIT. If you are in need of accommodations due to a disability please contact Chantonette Lyles, Associate Director of Disability Support Services at [973-596-5417](tel:973-596-5417) or via email at lyles@njit.edu. The office is located in Fenster Hall Room 260. For further information regarding self identification, the submission of medical documentation and additional support services provided please visit the Disability Support Services (DSS) website at:

- <https://www.njit.edu/studentssuccess/accessibility/>

Important Dates (See: [Summer 2020 Academic Calendar](#), Registrar)

Date	Event
May 18, 2020	First Day of Classes
May 18, 2020	Last Day to Add/Drop Classes for FIRST, MIDDLE, AND FULL
May 25, 2020	University Closed for Memorial Day
June 22, 2020	Last Day of FIRST SUMMER SESSION
June 29, 2020	First Day of FTF AND SECOND SUMMER SESSION
July 4, 2020	University Closed for Independence Day
July 13, 2020	Last Day of MIDDLE SUMMER SESSION
August 3, 2020	Last Day of FULL AND SECOND SUMMER SESSIONS
August 12, 2020	Last Day of FTF SUMMER SESSIONS

Course Outline

Day	Date	Sections	Topics
M	5/18	1.1	Systems of Linear Equations
		1.2	Row Reduction and Echelon Form
W	5/20	1.3	Vector Equations
		1.4	Matrix Equations
		1.5	Solutions of Linear Systems
		1.6	Applications to Chemistry
W	5/27	1.7	Linear Independence

		1.8	Linear Transformations
		1.9	Matrix Form of Linear Transformations
M	6/1	2.1	Matrix Operations
		2.2	Inverse of a Matrix
		2.3	Invertible Matrices
W	6/3	2.5	LU Factorization
		2.7	Applications to Computer Graphics
		3.1	Introduction to Determinants
M	6/8	3.2	Properties of Determinants
		3.3	Cramer's Rule
w	6/10	4.1	Vector Spaces and Subspaces
		4.2	Null Spaces and Column Spaces
M	6/15	4.3	Linear Maps
		4.5	Dimension of a Vector Space
		4.6	Rank
		4.9	Application to Markov Chains
W	6/17		Exam
M	6/22	5.1	Eigenvalues and Eigenvectors
W	6/24	5.2	The Characteristic Equation
		5.3	Diagonalization
M	6/29	6.1	Inner Product, Length, and Orthogonality
		6.2	Orthogonal Sets
W	7/1	6.3	Orthogonal Projections
		6.4	Orthogonal Projections
		6.7	Inner Product Spaces
M	7/6	7.1	Diagonalization of Symmetric Matrices
		7.2	Quadratic Forms
W	7/8		Exam Review
M	7/13		Exam

*Updated by Professor P. Ward - 4/29/2020
Department of Mathematical Sciences Course Syllabus, Summer 2020*