JAMESTOWN COMMUNITY COLLEGE
State University of New York

INSTITUTIONAL COURSE SYLLABUS

Course Title: Linear Algebra

Course Abbreviation and Number: MAT 2670 **Credit Hours:** 3 **Course Type:** Lecture

Course Description: Students will learn the algebra and geometry of finite-dimensional vector spaces and their linear transformations, the algebra of matrices and determinants, characteristic values and vectors, and diagonalization of matrices. A computer algebra system such as DERIVE is incorporated into the course. This course is intended for students majoring in mathematics, computer science and engineering.

Prerequisite: MAT 1720.

General Education Requirements Met
>**SUNY**
>Math

Student Learning Outcomes:
>Students who demonstrate understanding can:
>1. Perform matrix operations.
>2. Describe a vector space and find its basis and dimension.
>3. Use matrices for linear transformations.
>4. Find the Eigenvalues and Eigenvectors of a matrix.
>5. Recognize the importance of ethical behavior in fostering a community of mutual respect and dignity.
>6. Interpret and draw inferences from appropriate mathematical models such as formulas, graphs, tables, or schematics. [SUNY Gen Ed – Mathematics]
>7. Represent mathematical information symbolically, visually, numerically, or verbally as appropriate. [SUNY Gen Ed – Mathematics]
>8. Employ quantitative methods such as arithmetic, algebra, geometry, or statistics to solve problems. [SUNY Gen Ed – Mathematics]

Topics Covered:
- Introduction to Linear Equations and Gaussian Elimination
- Matrix Algebra
- Determinants
- R^n
- Vector Spaces
- Subspaces
- Spanning sets and linear independence
- Basis and Dimension
- Rank of a matrix
- Change of Basis (if time)
- Length and Dot Product
- Inner Product Spaces
- Orthonormal Bases
- Least Squares Analysis
- Linear Transformations
- Kernel and Range
- Matrices for linear transformations
- Transition Matrices and Similarity (if time)
- Eigenvalues and Eigenvectors
- Diagonalization
- Symmetric Matrices and Orthogonal Diagonalization
- Applications of Eigenvalues and Eigenvectors

Information for Students
- Expectations of Students
    - Civility Statement
    - Student Responsibility Statement
    - Academic Integrity Statement
- Accessibility Services
  Students who require accommodations to complete the requirements and expectations of this course because of a disability must make their accommodation requests to the Accessibility Services Coordinator.
- Get Help: JCC & Community Resources
- Emergency Closing Procedures

- Course grade is determined by the instructor based on a combination of factors, including but not limited to, homework, quizzes, exams, projects, and participation. Final course grade can be translated into a grade point value according to the following:

A=4.0	B+=3.5	B=3	C+=2.5	C=2	D+=1.5	D=1	F=0

- Veterans and active duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, VA appointments) are welcome and encouraged to communicate these to the instructor.

Effective Date: Fall 2023