

# NORTHWESTERN CONNECTICUT COMMUNITY COLLEGE

## COURSE SYLLABUS

**Course Title: Linear Algebra**

**Course #: MAT 272**

A first course in linear algebra for students in mathematics, science, and engineering. Topics include: systems of linear equations, matrices, determinants, vectors and vector spaces, linear transformations, eigenvalues and eigenvectors. Applications from various disciplines will be considered throughout the course. Computers and/or graphing calculators will be integrated as appropriate.

**Prerequisite:** C or better in Calculus II (MAT 256) or permission of the instructor.

**Goals:** It is the goals of the course to:

1. Solve systems of linear equations using matrices.
2. Perform operations with matrices.
3. Define and use terminology relating to general vector spaces including: subspaces, basis, linear independence, dimension, rank, nullity, kernel, and range.
4. Determine eigenvalues and eigenvectors of a matrix.
5. Apply concepts of inner product, length of a vector, orthogonality, and orthogonal projections.
6. Solve real-world problems using concepts from linear algebra.

**Outcomes:** At the end of the course, a student should be able to:

1. Find solution sets to systems of equations using the row reduction algorithm.
2. Apply the concepts of spanning, linear independence, and linear transformation.
3. Perform matrix algebra.
4. Apply the properties of an invertible matrix.
5. Find determinants and use the properties of determinants for determining matrix invertibility and various other applications.
6. Define and use terminology relating to general vector spaces including: subspaces, basis, linear independence, dimension, rank, nullity, kernel, and range.
7. Perform a change in basis using a transition matrix.
8. Determine the characteristic equation, eigenvalues, eigenvectors, and eigenspaces of a matrix.
9. Apply the concepts of similar matrices and diagonalizable matrices.
10. Apply concepts of inner product, length of a vector, orthogonality, and orthogonal projections.
11. Perform the Gram-Schmidt orthonormalization process.
12. Find all least-squares solutions to an inconsistent system of equations and the associated least-squares errors.
13. Apply the concepts of linear algebra to solve real-world problems in engineering, computer science, demographics, economics, biology, and statistics.

## College Policies

**Plagiarism:** Plagiarism and Academic Dishonesty are not tolerated at Northwestern Connecticut Community College. Violators of this policy will be subject to sanctions ranging from failure of the assignment (receiving a zero), failing the course, being removed/expelled from the program and/or the College. Please refer to your “Student Handbook” under “Policy on Student Rights,” the Section entitled “Student Discipline,” or the College catalog for additional information.

**Americans with Disabilities Act (ADA):** The College will make reasonable accommodations for persons with documented learning, physical, or psychiatric disabilities. Students should notify Dr. Christine Woodcock, the Counselor for Students with Disabilities. She is located at Green Woods Hall, in the Center for Student Development. Her phone number is 860-738-6318 and her email is [cwoodcock@nwcc.edu](mailto:cwoodcock@nwcc.edu).

**School Cancellations:** If snowy or icy driving conditions cause the postponement or cancellation of classes, announcements will be made on local radio and television stations and posted on the College’s website at [www.nwcc.edu](http://www.nwcc.edu). Students may also call the College directly at **(860) 738-6464** to hear a recorded message concerning any inclement weather closings. Students are urged to exercise their own judgment if road conditions in their localities are hazardous.

**Use of Electronic Devices:** Some course content as presented in Blackboard Learn is not fully supported on mobile devices at this time. While mobile devices provide convenient access to check in and read information about your courses, they should not be used to perform work such as taking tests, quizzes, completing assignments, or submitting substantive discussion posts.

**Sexual Assault and Intimate Partner Violence Resource Team:** NCCC is committed to creating a community that is safe and supportive of people of all gender and sexual identities. This pertains to the entire campus community, whether on ground or virtual, students, faculty, or staff.

Sexual assault and intimate partner violence is an affront to our national conscience, and one we cannot ignore. It is our hope that no one within our campus community will become a victim of these crimes. However, if it occurs, NCCC has created the SART Team - Sexual Assault and Intimate Partner Violence Resource Team - to meet the victim’s needs.

SART is a campus and community based team that is fully trained to provide trauma-informed compassionate service and referrals for comprehensive care. The team works in partnership with The Susan B. Anthony Project to extend services 24 hours a day, 7 days a week throughout the year.

### The NCCC team members are:

Ruth Gonzalez, Ph.D.	860-738-6315	Green Woods Hall Room 207
Susan Berg	860-738-6342	Green Woods Hall Room 223
Kathleen Chapman	860-738-6344	Green Woods Hall Room 110
Michael Emanuel	860-738-6389	Founders Hall Annex Room 308
Seth Kershner	860-738-6481	Library
Jane O’Grady	860-738-6393	Founders Hall Annex Room 212
Robin Orlomoski	860-738-6416	Business Office Room 201
Patricia Bouffard, Ex-Officio	860-738-6319	Founders Hall Room 103
Savannah Schmitt		Student Representative
Jacob Wujcik		Student Representative

At NCCC we care about our students, staff and faculty and their well-being. It is our intention to facilitate the resources needed to help achieve both physical and emotional health.