

Math 348, Computational Linear Algebra, Fall 2026

Syllabus

Section 26719

MW 10:10-12:05 1S-112

Instructor: Joseph Maher

Office: 1S-222

Office hours: M 9:05-9:55, M 1:25-2:15, W 1:25-2:15 (in 1S-214)

Webpage: <http://www.maher.org.uk/~math/teaching>

Email: joseph.maher@csi.cuny.edu

Phone: (718) 982-3623

[Important Dates](http://www.csi.cuny.edu/currentstudents/academiccalendars/) (<http://www.csi.cuny.edu/currentstudents/academiccalendars/>)

Text: [Numerical Linear Algebra by Rachel Thomas](https://github.com/fastai/numerical-linear-algebra/) (<https://github.com/fastai/numerical-linear-algebra/>)

Homework: Homework will be assigned in class, quizzes, etc. I encourage you to discuss strategies for solving the homework problems with other students; however, your final write-up of the problems must be done entirely on your own.

Grading:

Homework/Attendance 25%

Quizzes/Paper/Presentation 25%

Midterm 25%

Final 25%

You must take the final exam at the time scheduled by the university.

Method of Study: Optimal Method of Study: (1.) Come to class (attendance is mandatory). (2.) Read the relevant sections after class. (3.) Do the homework. (4.) Compare your solutions with other students. (5.) Come to office hours or the help room with any remaining questions.

Help: Email is the best way to contact me. Come and see me during my office hours! [Free math tutoring](http://www.math.csi.cuny.edu/Students/Tutoring) is also available (<http://www.math.csi.cuny.edu/Students/Tutoring>).

Attendance: Attendance is mandatory.

Disability policy: Qualified students with disabilities will be provided reasonable academic accommodations if determined eligible by the Office for Disability Services. Prior to granting disability accommodations in this course, the instructor must receive written verification of student's eligibility from the Office of Disability Services, which is located in 1P-101. It is the student's responsibility to initiate contact with the Office for Disability Services staff and to follow the established procedures for having the accommodation notice sent to the instructor.

Integrity policy: CUNY's Academic Integrity Policy is available online at <https://csicuny.smartcatalogiq.com/en/current/undergraduate-catalog/academic-policies-and-procedures/academic-integrity-plagiarism-and-cheating/>

ROLE IN CURRICULUM

This course will satisfy a 300-level elective requirement for B.S. majors in Mathematics, Computer Science and the joint CS-Math degree. This course may be an elective or required course in a future Data Science and AI major.

LEARNING GOALS AND ASSESSMENT PLAN

LEARNING OBJECTIVE	EXAMPLE OF EVIDENCE
Students will be able to find canonical forms for matrices.	When the class is being assessed, the final exams will include embedded questions to assess student performance on these topic-specific learning goals.
Students will be able to find exponentials of matrices.	Same.
Students will be able to apply factorization algorithms.	Same.
Students will be able to apply principal component analysis algorithms.	Same.

[Undergraduate Catalog Course Description](#)

MTH 348 - Computational Linear Algebra (4 cr)

Course Title

Computational Linear Algebra

Catalog Description

Builds on the material in MTH 338 Linear Algebra with an emphasis on effective computational approaches as a foundation for further study in data science, machine learning and AI. Topics include matrix canonical forms, exponentials, tensor products, singular value decompositions, principal component analysis and compressed sensing. Computational aspects include stability, speed, resource usage, effective factorization methods, stochastic gradient descent and L1 methods for sparse matrices.

Credit Hours

Minimum 4

Max 4

Academic Progress Units 4

Requirement Designation

Regular Liberal Arts

Prerequisites & Corequisites

Pre-requisite MTH 338

Components

Lecture

Contact Hours 4

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