
Math 417: Computational Linear Algebra

Fall 2022

Department of Mathematical Sciences, UWM

Lecture Time and Place

2:30 PM - 3:45 PM, EMS 424A, Monday and Wednesday

Instructor

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Textbook

Numerical Linear Algebra, G. Allaire and S. M. Kaber, Springer, 2008. ISBN 978-0-387-68918-0.

Prerequisite

Calculus, linear algebra, and basic computer programming skills.

Course Overview

- **Direct Methods for Solving Linear Systems:** Gaussian elimination method, LU decomposition method, and Cholesky method.
- **Numerical Algorithms for Solving Least Squares Problems:** Normal equation method, and QR factorization method.
- **Iterative Methods for Solving Linear Systems:** Jacobi method, Gauss-Seidel method, successive over-relaxation method, and preconditioned conjugate gradient method.
- **Numerical Algorithms for Computing Eigenvalues:** Power method, Jacobi methods, Givens-Householder method, and Lanczos method.

Grading

- Four homework evaluations: 60 %. Each for 15 %.
- Attendance: 10 %. 1 % reduction for one class missing.
- Final Exam: 30 %.
- Grading scale:
A (90-100), A- (84-89), B+ (79-83), B (75-78), C (68-74), D (60-67), F (< 60)

Important Dates

- September 7: First class
- September 19: Last day to add class

- October 3: Last day to drop without a "W" on academic record
- November 13: Last day to drop or withdraw from full-term classes
- November 23 - 27: Thanksgiving Break - No classes
- December 14: Last day of the class
- December 19: Final Exam (3:00 PM-5:00PM)
- December 23: Last day of the term

Homework:

Doing homework well is essential to be successful in this class. The homework will be assigned in the class. You are required to complete all the homework assignments. Some selected homework problems will be graded and discussed in class.

Attendance:

Attendance at lectures is required. Attendance will be taken after the first week. One point reduction will be taken for each class missing. The maximum of class missing reduction points is 10.

There is no provision for absences due to vacations, family outings and other social activities, other special plans and appointments, etc. Absences due to illness require a medical excuse on Physician's letterhead, signed by the physician. Students will be allowed to complete examinations or other requirements that are missed because of religious observances with a letter signed by the priest. They must be submitted before any alternate arrangements for a missing test will be considered.

Statement of Academic Misconduct

The university has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others' academic endeavors. Further information can be found at

http://www4.uwm.edu/acad_aff/policy/academicmisconduct.cfm.