

Instructor: Dr. Franz X. Tanner

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Lectures: WMF 4:05–4:55 PM, 327B Fisher Hall

Office Hours: By appointment

Prerequisites: Introductory course in linear algebra and programming experience, or consent of instructor.

Textbook: Lloyd N. Trefethen, David Bau, III, *Numerical Linear Algebra*, SIAM, Philadelphia, 1997.

Contents: Topics covered include:

Basic concepts, singular value decomposition, QR factorization and least-squares, conditioning and stability, systems of equations, eigenvalue problems, iterative methods.

Computing: Access to one of the computing environments such as Matlab, MathCad, Mathematica, Python, etc. is required in order to do some of the homework assignments.

Course Grade: The course grade will be based on periodically assigned homework (50%) and a final exam (50%).

Additional References:

- Tomas B. Co *Methods of Applied Mathematics for Engineers and Scientists*, Cambridge University Press, 2013.
- James W. Demmel, *Applied Numerical Linear Algebra*, SIAM, Philadelphia, 1997.
- Laurene Fausett, *Numerical Methods: Algorithms and Applications*, Prentice Hall, 2003.
- Gene H. Golub and V. Van Loan, *Matrix Computations*, fourth edition, John Hopkins U. Press, Baltimore, 2012.
- Michael T. Heath, *Scientific Computing: An Introductory Survey*, second edition, McGraw-Hill, 2002.
- C.T. Kelley, *Iterative Methods for Linear and Nonlinear Equations*, SIAM, 1995.
- David Kincaid and Ward Cheney, *Numerical Analysis: Mathematics of Scientific computing*, third edition, Brooks/Cole, 2002.
- Carl D. Meyer, *Matrix Analysis and Applied Linear Algebra*, SIAM, Philadelphia, 2000.
- Singiresu S. Rao, *Applied Numerical Methods for Engineers and Scientists*, Prentice Hall, 2002.
- Gilbert Strang, *Linear Algebra and Its Applications*, third edition, International Thomson Publishing, 1988.
- David S. Watkins, *Fundamentals of Matrix Computations*, third edition, Wiley, New York, 2010.

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