MATH385 / MATH685, Numerical Methods I
Spring 2024

Instructor: SA Kwon
Resources: Numerical Analysis, 2nd Ed (Tim Sauer, Pearson Education, 2012); Various.

HUNTER
The City University of New York

#	Topic
01	00 Introduction: Syllabus, Coursework Expectations. 00 Review of Basics: Polynomials, Base 2, Floating Point.
02	00 Review of Basics: Floating Point (continued), Error, Basic Analysis.
03	01 Rootfinding: Bisection, Fixed-Point Iteration.
04	01 Rootfinding: Newton's Method, Secant Method.
05	02 Systems of Equations: Gauss Elimination, LU Factorization, PA-LU Factorization.
06	02 Systems of Equations: Iterative, Symmetric-Positive Definite Matrices, Newton's Multivariate.
07	03 Interpolation: Polynomial Interpolation, Interpolation Error.
08	03 Interpolation: Chebyshev, Cubic Splines, Bezier Curves.
09	04 Least Squares: LSQ, Models.
10	04 Least Squares: QR Factorization, GMRES, Non-Linear.
11	05 Differentiation & Integration: Differentiation.
12	05 Differentiation & Integration: Newton-Cotes, Romberg.

This course provides an introduction to Numerical Methods. The later topics may be more of an overview, less in-depth than earlier topics. That will depend on the overall profiency of all students enrolled this semester. Coursework requires coding; however, a programming language is not a prerequisite. Python is supported but a limited number of other languages will be accepted.

Lecture notes will be provided and other resources as relevant.

Weekly homework and weekly quizzes will be 70% of the grade; attendance of Math & Statistics Department Special Lectures will be 5% of the grade; the final will be the remainder. Extra credit will be available throughout the course.