Course: MATH 2P20 (NUMERICAL ANALYSIS I)
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Topics to be covered

Newton and Lagrange and Hermite interpolations.

Natural cubic spline.

Least-square fit (both discrete and continuous), weights, Gram-
        Schmidt process and orthogonal polynomials (Legendre,
        Chebyshev and Laguerre)

Linear system of equations, Gaussian elimination with scaled
        pivoting, matrix inverse, LU factorization, tridiagonal
        systems.

Numerical integration: trapezoid and Simpson rules, Romberg
        algorithm. Designing formulas for Gaussian integration.

Numerical differentiation, Richardson extrapolation.

Newton's method for solving nonlinear equations, extended to two and
        more unknowns.

Boundary-value problems for second order differential equations,
        finite-difference technique, Richardson extrapolation.

Eigenvalues and eigenvectors of square matrices. Householder's
        method and the QL algorithm.

Marking Scheme: Assignments   - 30%
**   Two Midterms   - 15% each**
**   Final Exam   - 40%**