Math 280 Course Content and Objectives

COURSE CONTENT AND SCOPE - **Lecture:** Outline the topics included in the lecture portion of the course *(Outline reflects course description, all topics covered in class).*	Hours Per Topic	COURSE OBJECTIVES - **Lecture:** Upon successful completion of this course, the student will be able to...*(Use action verbs - see Bloom's Taxonomy for 'action verbs requiring cognitive outcomes.')*
Propagation of errors due to truncation or rounding of real numbers and arithmetic operations with a finite number of digits including representation of integers and fractions, and floating point arithmetic.	6	Demonstrate how to represent integers and fractions in computer formats. Calculate with floating point arithmetic. Discuss how to determine error propagation in computer programs.
Solutions of non-linear equations using fixed point iteration, Newton's method, and iterative methods.	9	Apply fixed point iteration, Newton's method, and iterative methods to the solution of non-linear equations.
Computational methods for solving matrix systems including elimination and pivoting, triangular factorization, inverses, condition numbers, determinants, and iterative methods.	12	Solve matrix systems computationally by employing the concepts of elimination and pivoting, triangular factorization, inverses, condition numbers, determinants, and iterative methods.
Methods for describing a tabulated function with a polynomial function including interpolating polynomials, divided differences, piecewise cubic interpolation, data fitting, and orthogonal polynomials.	13	Demonstrate how to interpolate data in tabular form by employing the methods and concepts of interpolating polynomials, divided differences, piecewise cubic interpolation, data fitting, and orthogonal polynomials.
Numerical methods for differentiation and integration applied to tabulated functions and explicit functions (including those functions whose antiderivatives cannot be calculated symbolically) including numerical differentiation, the trapezoid rule, Simpson's rule, Romberg iteration, and Gaussian quadrature.	12	Discuss and formulate the integration and differentiation of tabulated functions by employing the techniques of numerical differentiation, the trapezoid rule, Simpson's rule, Romberg iteration, and Gaussian quadrature.
Final examination.	2	Final examination.
Total: Total Lecture Hours In Section I Class Hours:	54 54	