UNIVERSITY OF NEBRASKA AT OMAHA

MATH 3250/8255: Intro to Numerical Methods

MW 1:00PM – 2:15PM | On-Campus | Dr. Mahboub Baccouch

Overview: Numerical methods are mathematical techniques for generating approximate solutions to mathematical problems of various types. The purpose of this course is to

1. Introduce numerical methods for approximating solutions to many mathematical problems.
2. Implement the numerical method using the software MATLAB.
3. Explain how, why, and when they can be expected to work.

Description: This course involves solving equations in one variable, linear systems of equations, interpolation, numerical differentiation and integration, numerical solutions to ordinary differential equations, numerical calculations of eigenvalues and eigenvectors, analysis of algorithms and errors, and computational efficiency. MATLAB will be used.

The main topics covered are: Algorithms and errors, Solution of equations in one variable; Polynomial interpolation and approximation; Numerical differentiation and integration; Initial-value problems for ordinary differential equations; Numerical methods for solving linear systems.

Objectives: This course will emphasize the development of numerical methods to provide solutions to common problems formulated in science and engineering. Students will be able to apply numerical methods to the problems that do not have analytic solutions and become familiar with techniques for solving numerically large problems. In particular, he/she should become familiar with Numerical techniques for solving nonlinear equations, interpolation, numerical differentiation and integration, linear systems, and differential equations.

Textbook: Numerical Methods, 4th Edition, by Faires and Burden, Brooks/Cole, 2013

For Whom Intended: Undergraduates and first year graduates (majors in mathematics, engineering, or computer science) needing a basic familiarity with numerical methods. Graduate students can take this class as a graduate level class (MATH 8255).

Prerequisites: Math 1960. It is recommended, but not required, that students take Math 2050 (Applied Linear Algebra) Math 2350 (Differential equations) before taking this course.
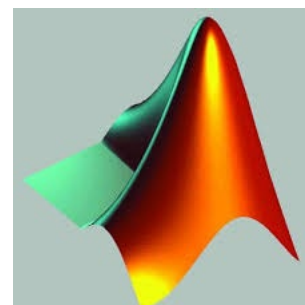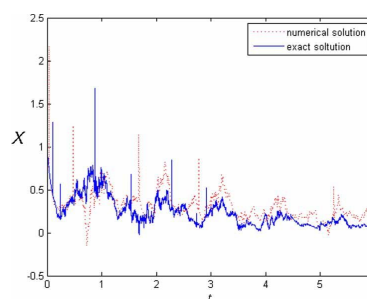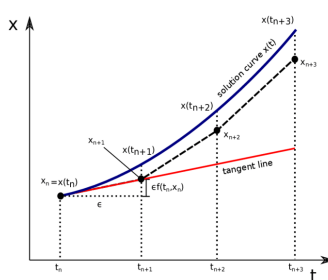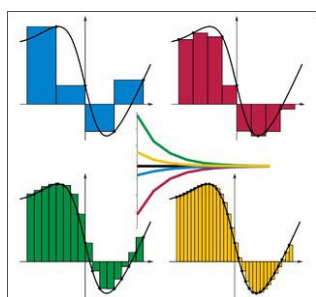
For More Information:

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