

University of Arkansas - Fort Smith
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General Syllabus

MEEG 27003 Numerical Methods I

Credit Hours: 3

Lecture Hours: 3

Laboratory Hours: 0

Prerequisite or corequisite: MATH 29147 Differential Equations

Effective Catalog: 2018-2019

I. Course Information

A. Catalog Description

Programming review, interpolation, curve fitting, optimization, computations with series, numerical integration, and the numerical solution of algebraic, transcendental, simultaneous and differential equations.

B. Additional Information

A second semester sophomore level Mechanical Engineering required course. Can be used as a general engineering elective for Electrical Engineers.

II. Student Learning Outcomes

A. Subject Matter

Upon successful completion of this course the student will be able to:

1. Apply math through differential equations to solve engineering problems.
2. Curve fit experimental data to various forms.
3. Apply constrained and unconstrained optimization methods to cost and profit optimization problems.
4. Develop programs and mathematical tools applicable to engineering problems.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Critical Thinking Skills - Students will identify a concept or problem, dissect or isolate its components, organize information for decision making, establish criteria for evaluation, and draw appropriate conclusions in engineering problems.

Quantitative Reasoning - Students will develop mathematical programs and formulae as advanced problem solving methods.

III. Major Course Topics

- A. Programming
- B. Errors, Series Differentiation
- C. Nonlinear Equations
- D. Simultaneous Equations
- E. Optimization
- F. Curve Fitting, Interpolation
- G. Integration
- H. Ordinary Differential Equations
- I. Tests