University of Arkansas - Fort Smith
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General Syllabus

MEEG 2703 Numerical Methods I

Credit Hours: 3   Lecture Hours: 3   Laboratory Hours: 0

Prerequisite or corequisite: MATH 3214 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