

Mechanical Engineering
ME 17 Mathematics of Engineering
Required

Course Description

Engineering applications of mathematical methods. Topics include linear algebra and calculus.

Course Prerequisite

Engineering 3, Mathematics 5B (may be taken concurrently)

Text, References & Software

Applied Numerical Methods with MATLAB for Engineers and Scientists, 2nd Edition by Steven C. Chapra

Course Objectives

1. Students learn Matlab
2. Students learn basics of statistical analysis
3. Students learn numerical methods for solving nonlinear algebraic equations
4. Students learn techniques for solving sets of linear algebraic equations
5. Students learn numerical techniques for interpolation and curve fitting, including least-squares method
6. Students learn numerical methods for differentiation and integration

Topics Covered

1. Basics of statistical analysis
2. Numerical methods for solving nonlinear algebraic equations
3. Methods for solving sets of linear algebraic equations
4. Numerical techniques for interpolation and curve fitting, including least-squares method
5. Numerical methods for differentiation and integration

Credit units of class/laboratory Schedule:

3 units of lecture, 2.5 hr/week

Course Assignments

1 midterm exam
A final
Weekly homework assignments

Professional Component

3 units engineering topics

Course Outcomes

1. Gain experience using mathematics to model engineering systems
2. Learn techniques for analyzing data
3. Develop a working knowledge of useful computational techniques for engineering systems

Relationship to Program Objectives

1. Prepare students to succeed in the upper division lab and theory courses, which in turn prepares students to be successful mechanical engineers and competitive graduate students.
2. Strengthen the mathematics background of the students

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