



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Fundamentals of Mathematics for Engineers

ENGR 1138

Credit Hours:

4.00 - 4.00

Course Levels:

Undergraduate (1000-5000 level)

Course Components:

Recitation
Lecture
Lab

Course Description:

This application-oriented, hands-on, introduction to engineering mathematics course will provide an overview of the salient math topics most heavily used in beginning engineering courses. All math topics will be presented within the context of an engineering application, and reinforced through extensive examples of their use in the core engineering courses.

Prerequisites and Co-requisites:

Prereq: Math Placement Level N.

Course Goals / Objectives:

- Students will be able to solve problems involving applications of algebra and trigonometry in engineering
 - Students will be able to solve problems involving applications of vectors and complex numbers in eng
 - Students will be able to solve problems involving applications of systems of equations and matrices in engineering.
 - Students will be able to solve problems involving applications of derivatives in engineering
 - Students will be able to solve problems involving applications of integrals in engineering
 - Students will be able to solve problems involving applications of differential equations in engineering
 - Students will be able to use MATLAB to solve a variety of introductory engineering mathematics problems
 - Students will be able to conduct a variety of physical experiments using engineering laboratory equipment
 - Students will be able to write proper technical executive summaries for engineering laboratory assignment
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Course Topics:

- Introductions Application of Algebra in Engineering – Linear and Quadratic Equations
- 2D Vectors in Engineering
- How Learning Works - The Importance of Reflection and Planning
- MATLAB Instruction
- Trigonometry - One Link Planar Robot, One and Two Link Planar Robots
- Goal Setting, Time Management; Stress Management
- Complex Numbers in Engineering
- Test Taking Strategies
- Sinusoids and Harmonic Signals in Engineering
- Measurement and Analysis of Harmonic Signals
- Systems of Equations and Matrices in Engineering
- Self-Awareness / Personal Responsibility
- Systems of Equations in Engineering: The Two-Loop Circuit
- Introduction to Derivatives in Engineering
- Scheduling 101
- Application of Derivatives in Electrical and Mechanical Eng
- Introduction to Integrals in Engineering
- Derivatives in Engineering: Velocity and Acceleration in Free-Fall
- Excel Instruction
- Integrals in Statics and Other Applications
- Integrals in Engineering: Work and Stored Energy in a Spring
- Introduction to Differential Equations
- Differential Equations in Engineering Applications
- Presentations

Designation:

Elective