Course Name:

Advanced Engineering Mathematics

Course Number: 20-014	**Credit:** 3
Program: Graduate	**Course Type:** Technical Required
Prerequisite: -	**Corequisite:** -

Course Description (Objectives):

This course is designed to familiarize students with essential mathematical topics in engineering. Subjects include differential equations, sequences, and Fourier analysis. These topics provide a foundation for solving engineering problems.

Course Content (outline):

- Chapter 1: Complex Numbers
- Chapter 2: Series, Integrals, and Fourier Series
- Chapter 3: Classification of Second-Order Linear Partial Differential Equations
- Chapter 4: Solution of the Diffusion (Heat) Equation by Separation of Variables and Fourier Transform Methods
- Chapter 5: Solution of the Wave Equation by Separation of Variables and d'Alembert's Method
- Chapter 6: Solution of Laplace's Equation by Separation of Variables and Fourier Transform Methods
- Chapter 7: One or more of the following:
  - Calculus of Variations
  - Green's Functions
  - Statistics, Probability, and Stochastic Processes
  - Tensors
  - Perturbation Methods
  - Optimization and Graph Theory

Department of Civil Engineering

References:

- Wiley, C.R. and Barrett, L.C. Advanced Engineering Mathematics, McGraw Hill.
- Myint-U, T. and Debnath, L. Partial Differential Equations for Scientists and Engineers, North-Holland.
- Kreyzig, E. Advanced. Engineering Mathematics. John Wiley
- Hildebrand, F.B., Advanced Calculus for Applications. 2nd Edition, Prentice-Hall, Englewood Cliffs, New Jersey 1976.