



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Advanced Mathematical Methods in Engineering

MECHENG 8518

Credit Hours:

3.00 - 3.00

Course Components:

Lecture

Course Description:

Fourier series, complex differentiation and integration and transform and Green's function for solution of problems arising in heat transfer, solid mechanics, fluid mechanics; linear operators as applied to engineering problems.

Prerequisites and Co-requisites:

Prereq: Grad standing in Mechanical, Aerospace, or Nuclear Engineering; or permission of instructor.

Course Goals / Objectives:

- Introduce Fourier Series, Sturm Liouville problems and Green's Functions (ODEs) at an advanced level as applied to heat and solid mechanics.
- Introduce Laplace and Fourier Transforms at an advanced level as applied to heat transfer, fluid mechanics, and solid mechanics(cables and strings).
- Analyze and solve the three types of partial differential equations: Laplace, heat and Wave equations in two and three spatial dimensions.
- Introduce the concepts of asymptotic analysis and singular perturbations as applied to heat transfer, fluid mechanics, and solid mechanics(cables and strings).