

MATHEMATICS 341  
TOPICS IN APPLIED MATHEMATICS

I. Introduction

A. Catalog Description

A study of classical and modern topics in applied mathematics. Topics can include complex numbers, Fourier series, generalized functions, integral transforms, special functions, partial differential equations, Green's functions and the theorems of Green and Stokes. *Prerequisites: Math 221, 232, and 301.*

B. Objectives

The main objective of this course is to introduce those branches of mathematics that are traditional underpinnings for the solution of applied problems, as well as illustrating how these techniques are used in actual situations.

C. Prerequisites - Math 221, 232, and 301.

II. Required Topics

There is a wide range of suitable topics but the following form a reasonable core of material.

A. Fourier Series and Integrals

B. Laplace Transformations

C. Partial Differential Equations

D. Bessel functions and Legendre Polynomials

III. Optional Topics

Here is an indication of the variety of choices available.

A. The Calculus of variations

1. Sturm-Liouville Eigenvalue problems

B. Finite Differences

C. The Heat Equation

D. Green's functions

E. The Wave Equation

F. Vector Fields

G. Introduction to Hilbert Space

IV. Bibliography

T. Bradbury, Mathematical Methods

R. Haberman Elementary Applied Partial Differential Equations

C. Wylie & L. Barrett Advanced Engineering Mathematics