Integral Equations and Transforms

Department: MATH
Course Number: 6583
Hours - Lecture: 3
Hours - Lab: 0
Hours - Recitation: 0
Hours - Total Credit: 3
Typical Scheduling: Every odd summer
Description:
Volterra and Fredholm linear integral equations, relation to differential equations, solution methods, Fourier, Laplace and Mellin transforms, applications to boundary value problems and integral equations
Prerequisites:

Math 6701 or Math 2403 and one of Math 2406 or Math 4305

Course Text:

No text

Topic Outline:

- Hilbert spaces, Fredholm alternative
- Fixed point theorems
- Volterra equations of the first and second kind
- Fredholm equations with L kernels
- Compact operators
- Integral operators with kernels of finite rank
- Self-adjoint integral operators
- Spectrum of positive definite integral operators
- Applications to ordinary differential equations
- Green's functions
- Sturm-Liouville theory
- Fourier transform
- Laplace transform
- Mellin transforms
- Application to partial differential equations