

# Harmonic Analysis

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### Outline

1. Fourier Series of a periodic function. Fejer kernel. Convergence Properties.
2. Convolution and Fourier Series. Heat Equation. Diagonalization of convolution operators.
3. Fourier Transforms on  $R^d$ .
4. Multipliers and singular integral operators. Interpolation.
5. Sobolev Spaces, Applications to PDE and  $\Psi$ DE.
6. Theorems of Paley-Wiener and Wiener.
7. Hardy Spaces. Prediction.
8. Compact Groups. Peter-Weyl Theorem.

Here are thge list of books on the reserved list at CIMS Library. There is no preferred textbook.

1. Boerner  
Representations of groups;
2. Dym and McKean  
Fourier series and integrals
3. Munroe      Introduction to measure and integration
4. Sommerfeld  
Partial differential equations in physics
5. Stein  
Introduction to Fourier analysis on Euclidean spaces
6. Stein  
Singular integrals and differentiability properties of functions