

Spectral theory



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ABSTRACT: Spectral theory extends to linear operators on infinite dimensional (topological) vector spaces the chapters of linear algebra dealing with eigenvalues and eigenvectors of matrices and their reduction to normal forms (Jordan, triangular, diagonal). This lecture is an introduction to the spectral theory on bounded and unbounded operators on Hilbert spaces. It is strongly biased towards application of this topics to quantum mechanics and quantum field theory.

SYLLABUS

1. Bounded operators on Hilbert spaces and C^* -algebras
2. Compact operators and their spectral decomposition
3. Unbounded operators on Hilbert spaces, Schrödinger operators
4. Functional calculi and the spectral theorem
5. Discrete and essential spectra
6. Perturbation theory of discrete eigenvalues

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