

For the request form:

Math689

**Special Topics in Topological Insulators I.
Mathematical Tools for Solid State Theory.**

Instructor P. Kuchment

(possibly with some assistance from G. Berkolaiko and A. Bonito)

- **Abbreviated course description:**

Aiming to provide mathematicians with basic tools needed in the exploding area of topological materials, this first part of the two-semester course will describe the main analytic and topological tools arising from and required in the solid-state physics.

- Although the course **has not been taught in this form before**, it will have some intersection with the class Math 664 Periodic Ordinary and Partial Differential Equations and Their Applications taught in Spring 2017 by P. Kuchment
- **The recommended prerequisites** (or the instructor's consent): Basic knowledge of the real, complex, and functional analysis. Basics of ordinary and partial differential equations, and Fourier transform are also highly recommended.
- **Sources to be used:** notes for the students and survey articles.