Math 994
Fall 1996
Alexander Ramm
"Introduction to ill-posed and inverse problems"

The material will be taken partly from the books:
2) A.G. Ramm, A.I. Katsevich, The Radon transform and local tomography, CRC Press, Boca Raton, 1996;

Contents:

Part 2. i) Inverse problems: theoretical basis for remote sensing and non-destructive evaluation. Examples from geophysics, medicine, technology. Basic idea: getting information about the properties of a body from the observation of waves scattered by the body on some surface located outside the body.
   ii) uniqueness theorems for inverse problems, and, especially, for inverse scattering problems; completeness of the sets of products of solutions to homogeneous PDE (partial differential equations): Property C for PDE and its applications.
   iii) solution of some inverse problems of geophysics, ocean acoustics, etc.


Prerequisites for the course. Not much background is assumed: calculus, elements of complex and real analysis, elements of ODE and PDE, elements of linear algebra. Knowledge of basic functional analysis helps, but all the background material needed will be briefly reviewed. The course can be taken by mathematics and engineering graduate students. Questions can be discussed with Prof. A.G. Ramm by phone 532-0580 or in the office CW 207.

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