Math 722 - Wave propagation - Fall 2013

MTh 4 pm –5:30 pm
Location: TBA

Instructor Catalin Turc (catalin.c.turc@njit.edu)
Office: Cullimore 625, Phone (973) 596-5378
Office hours: MTh 10:30-11:30 or by appointment
WEB: https://njit.edu/cct21/

Course Information and policies:

• **Text:** *Periodic Integral and Pseudodifferential Equations with Numerical Approximation*, by J. Saranen and G. Vainiko

• **Additional references:** *Inverse Acoustic and Electromagnetic Scattering Theory*, by D. Colton and R. Kress

• **Course Overview:**

  1. Modeling of the wave equation
  2. Modeling of acoustic waves, Helmholtz equation
  3. Wave equation in 1D, 2D, 3D
  4. Fundamental solution of the Helmholtz equation, scattering problems in the frequency domain, radiation conditions
  5. Boundary integral equation formulations of frequency domain scattering problems, layer potentials
  6. Weak formulations of the boundary integral equation formulations of frequency domain scattering problems
  7. Numerical solutions of frequency domain scattering problems via boundary integral equations: collocation methods
  8. Numerical solutions of frequency domain scattering problems via boundary integral equations: boundary element methods
  9. Time domain scattering problems, convolution quadratures

• **Homework:** Homework problems will be assigned and collected bi-weekly.
• **Exams and Grading**: There will be one midterm and a final exam.

  1. There will be a take-home project