Class content:

- **Models and methods:** discrete and continuous models; linear analysis, equilibrium and minimum principles; calculus of variations; principal component analysis (singular value decomposition) and orthogonal expansions; asymptotic and Fourier analysis; least squares; constrained and unconstrained optimization.

- **Guided projects and computer lab activities:** (do not require prior computing expertise)
  - image reconstruction and deblurring, data clustering, web search engines and recommender systems,
  - linear and quadratic programming; transportation problem,
  - applications of Fourier analysis: equilibria, touch-tone dialing, bar-code reading,
  - Kalman filter and GPS,
  - asymptotic analysis.

- As time permits, a gentle introduction to inverse problems and Monte Carlo techniques will be included.

**PREREQUISITES:** MTH 256 and MTH 341 or equivalent and junior status (or Instructor approval)

**TEXT:** Gilbert Strang “Introduction to Applied Mathematics”, Wellesley, 1986

**CREDIT:** counts toward the upper division elective requirement for the math major and minor