MTH 499/599 (Spring 2014)

Models and Methods of Applied Mathematics

www.math.oregonstate.edu/~mpesz/499-599_S1

MWF 2:00-3:00pm, Instructor: M. PESZYNSKA

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