COURSE TOPICS

- linear equations
- solutions based matrix factorization
- Singular value decomposition
- linear least squares
- numerical algorithms
- convergence
- applications
- non linear equations
- unconstrained minimization
  - gradient
  - hessian
  - conjugate gradient
  - newton's method
- applications and computational issues
- linear programming
- geometric interpretation
  - simplex method
  - duality
  - primal dual method
  - interior point methods
  - ellipsoidal methods.
  - computational issues
- integer programming
- LP relaxation
- examples from combinatorial optimization
- shortest paths
- network flows and matchings.

PREFERRED TEXT BOOKS

- M T Heath
  "Scientific Computing" (6).
- C H Papadimitriou & K Steiglitz (7)
  "Combinatorial Optimization : Algorithms & Complexity
- S Boyd & L Vandenberghe
  "Convex Optimization"
- L Vandenberghe
  Lecture notes for Applied Numerical Computing.
- D Bertisimas & JN Tsitsiklis
  "Introduction to Linear Optimization".
- J Matousek and B Gartner, ~~Understanding~~
  "Understanding and using Linear Programming"