

Operations Research
COURSE NUMBER: 26:711:652
COURSE TITLE: Nonlinear Optimization

COURSE MATERIALS

Textbooks:

Main:

1. A. Ruszczyński, *Nonlinear Optimization*, Princeton University Press 2006

Supplementary:

2. D. P. Bertsekas, *Nonlinear Programming*, 2nd Ed., Athena Scientific, 1999
3. J.-F. Bonnans, J.C. Gilbert, C. Lemarechal, C.A. Sagastizábal, *Numerical Optimization: Theoretical and Practical Aspects*, Springer 2006.
4. J. Nocedal and S. Wright, *Numerical Optimization*, Springer 2006

<https://blackboard.rutgers.edu>

FINAL GRADE ASSIGNMENT

Grading: The final grade will be based on homework and project assignments, involving theoretical problems and computational projects.

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COURSE SCHEDULE

1. Convex sets
2. Convex functions
3. Tangent and normal cones
4. Optimality conditions
5. Lagrangian duality
6. Applications of duality
7. The method of steepest descent
8. Newton's method
9. The conjugate gradient method
10. Nongradient methods. Truncated Newton's method
11. Feasible direction methods. Penalty methods
12. Dual and augmented Lagrangian methods
13. Sequential quadratic programming
14. Interior point (barrier) methods