Course deails of IE 609 - Mathematical Optimisation Techniques

Fields	Content
Course Name	Mathematical Optimisation Techniques
Total Credits	6.0
Type	Theory
Lecture	3.0
Tutorial	
Practical	
Selfstudy	
Half Semester	N
Text Reference	• M. Bazaara, H. Sherali, and C. Shetty. Nonlinear Programming: Theory and Algorithms (3rdedition), Wiley-Interscience, 2006.• D. Bertsekas. Nonlinear Programming (2nd edition), Athena Scientific, 1999.• D. Bertsimas and J. Tsitsiklis. Introduction to Linear Optimization, Athena Scientific, 1997.• J. Nocedal and S. Wright. Numerical Optimization, Springer-Verlag, 1999.• A. Ruszczynski. Nonlinear Optimization, Princeton University Press, 2006.
Description	Revised Syllabus: Aim of course: To develop understanding of theory and computational schemes for optimization problems . Major Contents: Examples of Optimization problems, mainly from decision making viewpoint. A brisk look at linear programming: Fundamental theorem of linear programming, Degenerate solutions, Simplex based methods, Cycling, Duality, Complementary slackness conditions. Non-linear programming: First and second order conditions. Iterative methods and associated issues. Line search methods: Stationarity of limit points of steepest descent, successive step-size reduction algorithms, etc. Hessian based algorithms: Newton, Conjugate directions and Quasi-Newton methods. Constrained optimization problems: Lagrange variables, Karush-Kuhn-Tucker

	conditions, Regular points, Sensitivity analysis. Quadratic programming, Convex problems. Optional Topics: Mixed integer models; Interior point methods; Iterative schemes for constrained problems; Sequential quadratic programming methods; Barrier methods; Trust-region methods, etc.
Last Update	2020-07-15 13:00:27.103114