

# Optimization (Reading course)

## Jan – May, 2019

**Instructor:** Sandeep Juneja

**Syllabus:** Linear and Dual Spaces, Optimization in Hilbert space, Optimization of functionals, Global theory of constraint optimization, Local theory of constraint optimization, Dimension-free convex optimization, Almost dimension-free convex optimization in non-Euclidean spaces, Non-Convex Projected Gradient Descent, Alternating Minimization, Intro. To stochastic control (if time permits)

### Reference texts:

- Optimization by Vector Space Methods by David G Luenberger
- Convex Optimization: Algorithms and Complexity, Sebastian Bubeck
- Convex Optimization, Stephen Boyd and Lieven Vandenberghe. Cambridge University Press
- Linear and Nonlinear Programming by David G. Luenberger
- Non-convex Optimization for Machine Learning, P. Jain and P. Kar
- Controlled Markov Processes and Viscosity Solutions, Fleming and Soner

### Miscellaneous:

The course would involve two lectures a week of duration hour and a half each (primarily by students). The evaluation would be based on two exams (30 marks each), homeworks (20 marks) and presentations quality (20 marks).