



E0230 Aug 3:1

Computational Methods of Optimisation

Instructor

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Teaching Assistant

Email:

Department: Computer Science and Automation

Course Time: Mon, Wed 11:00am-12:30pm

Lecture venue: CSA 117

Detailed Course Page: <http://drona.csa.iisc.ernet.in/~cmo/>

Announcements

Brief description of the course

Optimization is widely used in many fields of Engineering and Basic Sciences.

This course serves as an Introduction to Optimisation at the Graduate level. The focus of this course is to introduce classical algorithms for continuous optimisation for both constrained and un-constrained setting.

Prerequisites

Linear Algebra

Syllabus

Need for unconstrained methods in solving constrained problems. Necessary conditions of unconstrained

optimization, Methods of line search, Goldstein and Wolfe conditions for partial line search. Global

convergence theorem, Steepest descent method. Quasi-Newton methods: DFP, BFGS, Broyden family.

Conjugate-direction methods: Fletcher-Reeves, Polak-Ribierre. KKT conditions, Convex programming,

Duality, Linear Programming, Simplex method, Gradient Projection, Penalty methods.

Course outcomes

Students completing the course should be able to implement Optimisation algorithms to real life problems.

They should be also able to formulate engineering problems as an Optimisation.

Grading policy

30% Assignments, 40% Midterm, 40% Final

Assignments

Details can be found in the course website

Resources

Fletcher R., Practical Methods of Optimization, John Wiley, 2000.

David G. Luenberger and Yinyu Ye, Linear and Nonlinear Programming, Springer

Yurii Nesterov, Introductory Lectures on Convex Optimization, Springer

Stephen Boyd, Convex Optimization, Cambridge University Press

Stephen Boyd, Notes on Subgradient methods.