Syllabus Of EL 6233

Polytechnic Institute of New York University

Department of Electrical and Computer Engineering

(Online) EL6233: System Optimization Methods

Instructor: Prof. Zhong-Ping Jiang e-mail: zjiang@poly.edu

ECE Dept. Web: eeweb.poly.edu/faculty/jiang

Course Objective

This course is appropriate for both upper-level undergraduates and graduate students with basic knowledge in matrix theory (linear algebra) and calculus. Optimization is a very important subject which finds applications in many branches of science and engineering, to name a few, economics, computer science, financial engineering, systems engineering, electrical and computer engineering, mechanical engineering. The course aims to equip students with practical optimization methods for solving real-world applications and prepare them for a career in academia and industry. Topics to be covered include linear programming, nonlinear programming, calculus of variations and dynamic programming.

Course Outline

1. Introductory Examples and Basics in Optimization

2. What Is Linear Programming?

3. The Simplex Technique
4. Duality and Sensitivity
5. Unconstrained Nonlinear Programming
6. Constrained Nonlinear Programming
7. Numerical methods, Duality and Applications
8. Midterm Examination (take home)
9. Basics of the Calculus of Variations
10. More theory of the Calculus of Variations
11. Applications of the Calculus of Variations
12. Dynamic Programming: Theory
13. Dynamic Programming: Applications
14. Project Presentation
15. Final Examination


Additional References:

Grading: Homework: 10%, Project: 20%, Midterm: 30%, Final: 40%