Nonlinear Programming

National Taiwan University of Science and Technology

Department of Electrical Engineering

Spring, 2019

Prerequisite: Basic Engineering Mathematics

Instructor: Shun-Feng Su,

　　　　　　Office : T2 502-3

　　　　　　Phone: ext 6704

　　　　　　E-mail : sfsu@mail.ntust.edu.tw

Classroom : TBD

Time : 09:10~12:10 Monday

References : E. K. P. Chong and S. H. Żak, *An Introduction to Optimization*,

Classnote: Available on http://intelligence.ee.ntust.edu.tw/su Please select the course information and the click the nonlinear programming icon to download

Tests : One Midterm and one final.

Nonlinear Programming
Course Description

Optimization is central to any problem involving decision making, whether in engineering or in economics. The task of decision making entails choosing between various alternatives. This choice is governed by our desire to make the "best" decision. The measure of goodness of the alternatives is described by an objective function or performance index. Optimization theory and methods deal with selecting the best alternative in the sense of the given objective function. The purpose of this course is to provide a working knowledge of optimization theory and methods. To accomplish this goal, we include many examples that illustrate the theory and algorithms discussed in the class. However, it is not my intention to provide a cookbook of the most recent numerical techniques for optimization; rather, my goal is to equip the students with sufficient background for further study of advanced topics in optimization.

最佳化是在很多領域中常面對的問題，在決策過程中當面對不同可選擇的可能中，如何選擇最好的是最佳化所要解決的。在這門課中，我們將介紹相關的最佳化理論及方法。基本上，去提供所有的常用可能的最佳化數值技術是不可能，因此，本課程主要在於提供學生充分之知識與概念，以足於當面對任何最佳化問題時知道如何解決。

Tentative Outline

- **Introduction of Optimization Problems**
- **One-Dimensional Search**
- **Gradient Methods**
- **Newton's Method and Its Variations**
- **The Use of Computational Intelligence**
- **Linear Programming**
- **Nonlinear Constrained Optimization**