

2016 NCTS

Short Course in *Optimization Theory and Mathematical Models (I)*

**Time: August 15-19 (Mon.)-(Fri)
2016, 09:00-17:00**

Venue: Rm 101, Astro-Math Bldg., NTU

Lecturer: Prof. Ruey-Lin Sheu (National Cheng-Kung University)

This is an introductory short course to translate a complex system into a kind of mathematical model, and to find the optimal solution or the equilibrium solution of the model. Solving an optimization problem requires to deal with systems of inequalities, including linear, nonlinear, dynamical, and stochastic. The course provides a step-by-step bottom-up training for students who want to get an idea in the area of optimization. We assume almost no prerequisite knowledge except for some basic calculus and linear algebra. We expect students to learn from this course the theory of optimization, skill of modeling, and the capability of using mathematical analysis to resolve practical problems. We hope that, eventually, everybody in class can appreciate that optimization theory is not only very practical and useful, but it also exhibits beautiful mathematics.

References:

1. Optimization Theory and Mathematical Models -- Introduction and Examples (Location Allocation Problem; Quadratic Assignment Problem; Diet Problems; Network flows; Production Scheduling; Separation of Points; Packing Problems; Set Covering Problems, etc.).
2. Solving Linear Programming using Simplex Method and NEOS.
3. Farkas Lemma and linear duality from minimal infeasible system.
4. Fixed Point Theorem and Nash Equilibrium in non-cooperative bimatrix games.

