最佳化方法與應用 MA5037*

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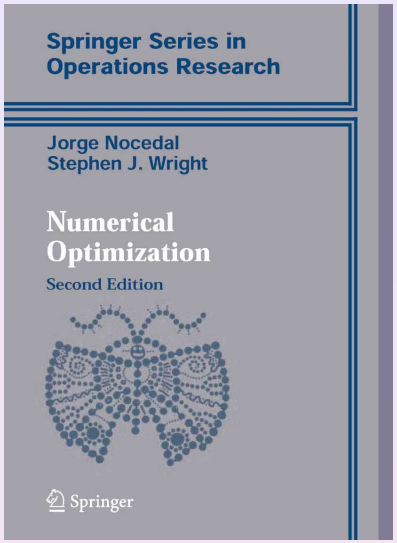
Course website: http://www.math.ncu.edu.tw/~cchsiao/Course/

Textbook:



Grade:

1. 1 midterm + 1 final exams = 70%.
2. Several homework assignments = 30 %.

Office: 鴻經館 310

Office hour: Monday 1-2PM or by appointment

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In this course we are going to cover the ideas of **unconstrained optimization**; that is, finding local minimum of real-valued functions with independent variables satisfying no constraint. The topics includes the following subjects:

1. Line search methods - the introduction of the most basic concept of the optimization of real-valued functions by finding a descent direction first and then choosing a feasible step size.
2. Trust-Region Methods - a more advanced concept of the optimization of real-valued functions by locating a range within which the minimum of a **model**, an approximation of the target function, has to be found, and then finding the minimum of the model directly.
3. Conjugate Gradient Methods - a special method of optimization.

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4. Quasi-Newton Methods - the advantage of the Newton method is its high rate of convergence; however, it requires that the initial guess is very closed to a local minimum and the computation of the second derivatives. The so-called quasi-Newton method is a method which sacrifices a little bit rate of convergence to overcome the difficulties that the Newton method encounters.
5. Least square problems: The least square problems are the most basic and fundamental source of optimization problems. We are going to use the methods introduced in the previous sections to find the local minimum of such kind of problems.
6. Nonlinear equations: Use the methods introduced in the previous sections to find the local minimum of nonlinear problems.

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