# 開 授 課 程 大 綱

| 開課單位系所 | | 清華大學/統計所 | | | | |
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| 課　　　號 | STAT 5510 | | 班　次 | | 學　分 | 3 |
| 名　　　稱 | 實驗設計與分析 (Experimental Design and Analysis) | | | | | |
| 授 課 教 師 | 鄭少為 | | | | | |

一.內容：

Data in statistical studies are often collected by conducting either experiments or surveys. Statistical experimental design is the branch of statistics that deals with the design and analysis of experiments. The methods of experimental design are widely used in the fields of agriculture, medicine, biology, marketing research, and industry. In this course, the topics to be covered include:

- basic principles and introduction to regression analysis
- experiments with a single factor, analysis of variance
- experiments with more than one factor, blocking, Latin squares, analysis of variance and covariance, random effects models, other analysis techniques
- factorial experiments at two levels, comparison with "one-factor-at-a-time" plans, analysis of location and dispersion, choice of optimal blocking schemes
- fractional factorial experiments at two levels, maximum resolution and minimum aberration for choosing optimal $2^{n-k}$ designs, choice of optimal blocking schemes
- three-level designs
- orthogonal arrays and analysis of experiments with complex aliasing

二.教科書及參考書：

Textbook: Wu, C.F.J. and Hamada, M. (2009), *Experiments: Planning, Analysis, and Parameter Design Optimization*, 2nd Edition. John Wiley & Sons.

References: TBA

三.成績評量方式：

Homework 30%; Midterm Exam 30%; Final Exam 40%

四.Course webpage: **TBA**

五.Prerequistes：

Knowledge of linear model and regression analysis