開 授 課 程 大 綱

開課單位系所		清華大學/統計所					
課　　　號	STAT 5410		班　次			學　分	3
名　　　稱	線性模式 (Linear Models)						
授 課 教 師	鄭少為						

一. 內容：

Linear model is one of the most fundamental and powerful data analysis methods in Statistics. This course will include various topics about linear models from an applied viewpoint, such as definition, fitting, inference, interpretation of results, meaning of regression coefficients, identifiablity, Gauss-Markov theorem, lack of fit, multi-collinearity, transformations of response and predictors, variable selection, ridge regression, principal components regression, partial least squares, regression splines, diagnostics, influential observations, robust procedures, ANOVA and analysis of covariance, randomized block, factorial designs, missing data.

二. 教科書及參考書：

Textbooks:

1. Faraway, J.J. (2015), *Linear Models with R*, 2nd edition, Chapman & Hall/CRC.

References:

1. Draper N.R., and Smith, H. (1998), *Applied Regression Analysis, 3rd edition*, Wiley.
2. Faraway, J.J. (2016), *Extending the Linear Model with R*, 2nd edition, Chapman & Hall/CRC.

三. 成績評量方式：

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

四. Course webpage：NTHU STAT 5410 - Linear Models

五. Prerequisites：

Knowledge of matrix algebra. Knowledge of basic probability and statistics. Computing will be required, but no specific prior experience is necessary.