

國立中正大學數學系課程大綱

課 碼：2315748_01

授課教師：王義富

學 分 數：3

修 別：選修

科目名稱：可靠度分析

英文譯名：Reliability Analysis

教學目標：

此課程希望讓學生了解常用的產品的失效模型，及其產品壽命的統計推論方法。這是一門評估產品使用壽命用的統計科學方法。主要介紹壽命模型的統計推論，亦探討最佳實驗設計議題。另外，也介紹常用的加速壽命(ALT)方法，以處理高可靠度產品之壽命推論問題。

授課大綱：

單元主題	內容綱要	上課週數
Reliability concepts and reliability data	Failure-time data, degradation data, repairable data.	2W
Models, censoring and likelihood for failure-	Hazard function, quantile function, models for discrete and continuous data, censoring.	2W
Nonparametric estimation	A generalized nonparametric estimation of $F(t)$ for interval right-censored and multiply censored data.	4W
Probability plotting	A graphical method to present data and guide modelling and present the results of analysis.	2W
Planning life test	Optimal design, large-sample approximation.	2W
Accelerated test models	Arrhenius, Eyring, inverse power relationship.	3W
Accelerated life tests (ALT)	Strategy for analyzing ALT data.	3W

教科書及參考書籍：

教科書: Statistical Methods for Reliability Data (1998) by W.Q. Meeker and L.A. Escobar, Wiley.

參考書: Statistical Models and Methods for Lifetime Data (2003) by J. F. Lawless, Wiley.

W. Nelson (1990). Accelerated Testing, Wiley.

評量方式：

Homework 30%

Midterm 40%

Final Report 30%