課程大綱及進度表

開課系所	數學三
開課學年	97
開課學期	1
課程名稱(中文)	數值分析導論
課程名稱（英文）	INTRODUCTION TO NUMERICAL ANALYSIS
課程碼	C133900
分班碼	
先修科目或先備能力	微積分，線性代數
學分數	3
開課教師	侯世章
e-mail	schou@mail.ncku.edu.tw
電話	65139
Office Hours	預約
課程概述	介紹一些數值分析的基本概念,並強調Matlab 程式寫作。
教學目標	期能對數值方法及程式寫作有基本的認識。

授課課程大綱明細	• Floating Point Numbers
	• Root Finding
	  o Bisection Method
	  o Newton’s Method
	  o Secant Method
	  o Fix point Method
	• Interpolation and Approximation
	  o Polynomial Interpolation

	o Error in Polynomial Interpolation o Spine Functions o The Best Approximation o Chebyshev Polynomials o A Near-Minimax Approximation o Least Square Approximation • Numerial Integration and Differentiation o The Trapzoidal and Simpson's Rule o Error Formulas o Gaussian Numerical Integration o Numerical Differentiation • Solution of Linear Equations o Matrix Arithematics o Gaussian Elimination o The LU Factorization o Error in Solving Linear Systerms o Iteration Methods • Numerical Linear Alegebra o Least Square Data Fitting o The Eigenvalue Problem o Nonlinear System • Ordinary Differential Equation o Introduction o Euler's Method

	o Convergence Analysis of Euler’s Method o Taylor and Runge-Kutta Methods o Multistep Methods o System of Differential Equations o Finite Differece Method for Two-Point Boundary Value Problems
參考書目	● Elementary Numerical Analysis ，by Atkinson and Han ● Numerical Analysys, by Burden and Faries ● Numerical Analysis, by Kincaid and Cheney
課程要求	
評量方式	期中， 期末考各佔 40%，作業及平時表現佔 20 %
課程網址	
助教資訊	
備註	