課程大綱及進度表

開課系所	數學三
開課學年	98
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
學分數	3
開課教師	侯世章
e-mail	schou@mail.ncku.edu.tw
電話	65139
Office Hours	略
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	期能對數值方法有基本的認識,並對 Matlab 有初步的了解。

授課課程大綱明細	• Matlab 簡介與實作
	• 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 Analysis, by Kincaid and Cheney
課程要求	
評量方式	期中， 期末考各佔 40%，演習及平時表現佔 20 %
課程網址	
助教資訊	
備註	