課程大綱及進度表

開課系所	數學系數學三
開課學年	100
開課學期	2
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	MatLab 程式語言
學分數	3
開課教師	王辰樹
e-mail	cswang@math.ncku.edu.tw
電話	65143
Office Hours	By Appointment
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	期能對基本數值計算方法有初步的認識。
授課課程大綱明細	**1. Introduction** ● The MATLAB and Octave environments ● Real numbers: How we represent them and How we operate with floating-point numbers 2. Root Finding ● Bisection Method ● Newton's Method ● Fix point Method 3. Approximation of functions and data ● Approximation by Taylor's Polynomials ● Polynomial Interpolation

	● Piece-wise Linear Approximation and Spine Functions ● Least Square Approximation **4. Numerical Differentiation and Integration** ● Approximation of function derivatives ● Numerical Integration: The Trapzoidal and Simpson's Formulas ● Interpolatory Quadratures 5. **Linear Systems** ● Matrix Arithematics ● Gaussian Elimination ● The LU Factorization ● Error in Solving Linear Systerms ● Iterative Methods 6. Eigenvalues and eigenvectors ● The power method ● Generalization of the power method ● Computation of all the eigenvalues
參考書目	Scientific Computing with MatLab and Octave, 2020, 3rd ed., by Alfio Quarteroni and Fausto Saleri
課程要求	1. 需出席上課 2. 作業習題需親力親為
評量方式	1. 平時成績（含上課出席與習題作業）佔 40% 2. 期中考試佔 30 3. 期末考試佔 30%
課程網址	http://www.math.ncku.edu.tw/~cswang/NumAnaly(under)l2012spring.html
助教資訊	洪晟芳 L16991015@mail.ncku.edu.tw (office: room206 in Math. Building)
備註	