

朝陽科技大學 095學年度第1學期教學大綱
Numerical Analysis 數值分析

當期課號	7405	Course Number	7405
授課教師	廖俊鑑	Instructor	LIAW,JIUN JIAN
中文課名	數值分析	Course Name	Numerical Analysis
開課單位	網路與通訊研究所碩士班一A	Department	
修習別	選修	Required/Elective	Elective
學分數	3	Credits	3
課程目標	數值分析就是介紹如何用電腦來解決數學問題, 從數學的理論與背景推導出解決該問題的各種數值方法, 並探討不同方法之優缺點和適用範圍. 更進一步要求同學寫成程式來做數值實驗, 以評比不同的數值方法. 這是一門數學理論與程式設計並重的課程.	Objectives	This course responds to the needs of the engineering and physical sciences curricula by providing an applications-oriented introduction to numerical methods/analysis. Rather than a pure discussion and analysis of methods, we shall often integrate a discussion of the properties of engineering and physical problems with the discussion of methods by which such problems may be solved numerically. This approach is more "natural" and more like the one students actually follow when applying numerical methods within their areas of interest. Topics in function approximation, nonlinear equations, interpolation, numerical integration and differentiation, and numerical solution of ordinary differential equations will be similarly treated. The discussion of approximate arithmetic and error propagation will also arise in a natural way.
教材	K.E. Atkinson, An Introduction to Numerical Analysis / S.C. Chapra, Applied Numerical Methods with MATLAB for Engineers and Scientists	Teaching Materials	K.E. Atkinson, An Introduction to Numerical Analysis / S.C. Chapra, Applied Numerical Methods with MATLAB for Engineers and Scientists
成績評量方式	期中30%,期末30%,作業40%	Grading	Mid-examination 30%; Terminal-Examination 30%; Homework 40%
教師網頁	http://www.cyut.edu.tw/~jliaw		
教學內容	許多工程數學問題常常複雜到不能直接用數學分析來簡易求解, 這個時候就要用數值計算的方法, 利用程式語言為工具設計程式, 然後靠電腦的快速計算能力來求解這些數學問題. 數值分析就是介紹如何用電腦來解決數學問題, 從數學的理論與背景推導出解決該問題的各種數值方法, 並探討不同方法之優缺點和適用範圍. 更進一步要求同學寫成程式來做數值實驗, 以評比不同的數值方法. 這是一門數學理論與程式設計並重的課程.	Syllabus	1.Mathematical Preliminaries 2.Computer Arithmetic Background 3.Solution of Nonlinear Equations 4.Solving Systems of Linear Equations 5.Eigenvalue Problems and Squares Problems 6.Approximating Functions 7.Numerical Differentiation and Integration 8.Solving Ordinary Differential Equations 9.Solving Partial Differential Equations

尊重智慧財產權，請勿非法影印。