朝陽科技大學 094學年度第2學期教學大綱
Numerical Modeling 數值模擬

當期課號	7076	Course Number	7076
授課教師	余志鵬	Instructor	YU,CHIH PENG
中文課名	數值模擬	Course Name	Numerical Modeling
開課單位	營建工程系碩士班一A	Department	
修習別	選修	Required/Elective	Elective
學分數	3	Credits	3
課程目標	本課程教導學生工程問題分析支步驟與方法；首先說明如何建立物理系統之數學模式，其次介紹如何將數學問題簡化爲適當之數值程序，進而探討所研究之物理問題或現象的數值近似解。課程內容包括：(1) 回顧研究所階段基本數學能力；包括矩陣運算，變分學原理，特徵值理論等。(2) 有限自由度系統之靜力平衡問題、特徵值問題、波動傳導問題。(3) 連續系統之靜力平衡問題、特徵值問題、波動傳導問題。(4) 有限元素法簡介。	Objectives	This course reviews basic numerical tools, Fortran special-purpose program, Matlab and Excel spreatsheet, extensively used in Civil engineering aspects. The topics covered include Errors, Taylor series, Rootfinding, solving Linear and nonlinear equations, numerical integration and difference, ODE, etc.
教材	課堂筆記與隨堂分發講義 主要參考資料 1. Finite Element Procedures, by Klaus-J邦rgen Bathe, Prentice Hall, 1996. 2. Engineering Analysis : A Survey of Numerical Procedures, by Stephen H. Crandall, Krieger Publishing, 1956 (reprinted 1983).	Teaching Materials	
成績評量方式	Homework 25% (about 6 times) 1 term project 25% Midterm and final exams 50% (each%25%)	Grading	Homework 25% (about 6 times) 1 term project 25% Midterm and final exams 50% (each%25%)
教師網頁			
教學內容	Numerical Treatment to 1. Equilibrium problems of discrete systems 2. Eigenvalue problems of discrete systems 3. Propagation problems of discrete systems 4. Equilibrium problems of continuous systems 5. Eigenvalue problems of continuous systems 6. Propagation problems of continuous systems Introduction to 7. Finite Element Method 8. Boundary Element Method (optional) 9. Dynamic Stiffness Analysis (optional)	Syllabus	Numerical Treatment to 1. Equilibrium problems of discrete systems 2. Eigenvalue problems of discrete systems 3. Propagation problems of discrete systems 4. Equilibrium problems of continuous systems 5. Eigenvalue problems of continuous systems 6. Propagation problems of continuous systems Introduction to 7. Finite Element Method 8. Boundary Element Method (optional) 9. Dynamic Stiffness Analysis (optional)