國立台灣科技大學 114學年 第2學期　課程大綱

Spring 2026 NTUST Course Outline

授課教師：許士昱

Instructor:Shi-Yu XU

課程名稱：有限元素法

Course Title：Finite Element Method

2026/11/3

課程代號： CT5202701 Course Code 學分數： 3 Credits	必選修：選修/半學年 Required/Electve:Elective/Half Yr. 先修課程： Prerequisites
節次教室： Time/Location	T2(IB-610) T3(IB-610) T4(IB-610)
專業核心能力： Core Professional Competencies	
課程網址： Course Website	
課程宗旨： Course Objectives	此課程提供有限元素法(FEM)應用在結構力學問題上的基本介紹，主要授課目標為瞭解有限元素法的基本觀念、優點、限制及實務應用。 This course will provide an introduction to the finite element method (FEM) as applied to the fields of structural mechanics problems. To have a fundamental understanding of the FEM concepts , their strengths, their limitations and their practical application is the major goal for this course.
課程大綱： Outline of Lectures	Week 1: Introduction to finite element method; Introduction to MATLAB Week 2: Bar element Week 3: Truss element Week 4: Finite element formulation of truss structures with MATLAB Week 5: Static condensation Week 6: Midterm Exam I Week 7: Euler-Bernoulli beam element Week 8: Rigid jointed frames Week 9: Frames with internal hinges; Eigenvalue analysis Week 10: Strong form and weak form Week 11: Dynamic formulation Week 12: Midterm Exam II Week 13: Stress and strain analysis; Introduction to ABAQUS Week 14: Analysis of truss structures with ABAQUS Week 15: Analysis of a frame with ABAQUS; Eigenvalue extraction with ABQUS Week 16: Final exam
授課方式： Method of Instruction	講授 Lecture：70% 分組討論 Group discussion：0% 案例研討 Case study：15% 操做練習 Practical exercises：15% 講授 Lecture：N/A%
教科書： Textbooks	本課程未使用任何特定教科書。 No textbook is required.
參考書目： References	

	1. Bucalem, M. L. and Bathe, K.-J. (2011). The Mechanics of Solids and Structures. Springer 2. Chandrupatla, T.R. and Belegundu, A.D. “Introduction to finite elements in engineering”, PrenticeHall. 3. Hughes T.J.R.. “The Finite Element Method: Linear Static and Dynamic Finite Element Analysis”, Dover Publications.
修課須知： Notice	本課程內容不會包括固體元素(solid element)之背景理論。 This course WILL NOT cover the finite element formulation of solid elements.
評量方式： Grading	Class Participation 10% Homework Assignments 25% Midterm Exam I ** 20% Midterm Exam II ** 20% Term Project 25%
備註說明： Notes	本課程某些作業必須自行撰寫 MATLAB 程式。 In some homework assignments, students will need to compose computer programs using MATLAB.