

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

2026/5/6

<p>課程代號： CT5202701 Course Code 學分數： 3 Credits</p>	<p>必選修：選修/半學年 Required/Elective:Elective/Half Yr. 先修課程： Prerequisites</p>
<p>節次教室： T2(IB-610) T3(IB-610) T4(IB-610) Time/Location</p>	
<p>專業核心能力： Core Professional Competencies</p>	
<p>課程網址： Course Website</p>	
<p>課程宗旨： 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. Course Objectives</p>	
<p>課程大綱： Week 1: Introduction to finite element method; Introduction to MATLAB Outline of Lectures 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 ABAQUS Week 16: Final exam</p>	
<p>授課方式： 講授 Lecture：70% Method of Instruction 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%</p>	
<p>教科書： 本課程未使用任何特定教科書。 Textbooks No textbook is required.</p>	
<p>參考書目： References</p>	

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： 本課程內容不會包括固體元素(solid element)之背景理論。
Notice This course WILL NOT cover the finite element formulation of solid elements.

評量方式： Class Participation 10%
Grading Homework Assignments 25%
Midterm Exam I ** 20%
Midterm Exam II ** 20%
Term Project 25%

備註說明： 本課程某些作業必須自行撰寫 MATLAB 程式。
Notes In some homework assignments, students will need to compose computer programs using MATLAB.