97-2 Preliminary Syllabus, Da-Yeh Univ

Information			
Title	有限元素法	Serial No. / ID	1265 / MUR5020
Dept.	機械與自動化工程學系碩士班	School System / Class	研究所碩士班1年1班
Lecturer	劉勝安	Full or Part-time	專任
Required / Credit	Optinal / 3	Graduate Class	NO
Time / Place	(二)78 / H543 (四)2 / H541	Language	Chinese

Introduction

Course Introduction: The finite element method has become a powerful and inevitable tool for solving a wide range of engineering problems, such as deformation and stress analysis of automotive, aircraft, building, and bridge structures. With the advance in computer technology and CAD systems, complex problems can be modeled with ease. Several alternatives can be tested on a computer before the first prototype is actually built. All of these suggests that we shall keep pace with these developments by knowing the basic theory, modelling techniques, and computational aspects of the finite element method. In this method, a complex region defining a continuum is discretized into simple geometric shapes called finite elements. The material properties and the governing relationships are considered over these elements and expressed in terms of unknown values at element corners. An assembly process, duly considering the loading and constraints, resulting in a set of equations. Solution of these equations gives us the approximate behavior of the continuum.
Goal: The objective of this course is to teach materials as described above, so that students not only understand the embedded theory in the finite element method, but also are equipped with the required techniques in implementing the actual analyses over engineering problems.

Outline

1. Fundametal Concepts
2. One-dimensional Problems
3. Trusses
4. Two-dimensional Problems Using Constant Strain Trianges
5. Axisymmetric Solids Subjected to Axisymmetric Loading
6. Two-dimensional isoparametric elements and numerical integration
7. Beams and Frames
8. Three-Dimensional Problems in Stress Amalysis
9. Dynamic Consideration

Prerequisite

Students should be equipped with computer knowledge
2. Students should be familiar with programming technique using suitable computer language.
3. Students should better have previously taken such courses as mechanics of material and elasticity.