

**ME 639**  
**APPLICATIONS OF FINITE ELEMENT ANALYSIS IN**  
**MECHANICAL ENGINEERING SYSTEMS**  
**FALL 2001**

**COURSE OBJECTIVES:** Design and analysis of basic machine components using finite element method.

**PREREQUISITES:** ME 439 and ME 522 or equivalent.

**TEXTBOOK:** Daryl L. Logan, *A First Course in the Finite Element Method*, 3<sup>rd</sup> ed., Brooks/Cole Publishing Company, 2001.

**REFERENCES:**

1. Charles E. Knight, *The Finite Element Method in Mechanical Design*, PWS-KENT Publishing Company, Boston, 1993.
2. Saeed Moaveni, *Finite Element Analysis - Theory and Application with ANSYS*, Prentice Hall, New Jersey, 1999.

**INSTRUCTOR:** Dr. C. Charles Yang, P.E.  
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E-mail: yang@me.twsu.edu  
Class Hours: 4:10 - 5:00 PM, M W, Classroom: 202 Eng. Bldg.  
Lab Hours: 7:00 - 9:30 PM Wednesday or 1:00 - 3:30 PM Friday  
Lab Location: 209 Eng. Bldg.  
Office Hours: 1:45 - 2:45 PM, M W (or by appointment)

**TOPICS:**

1. General Approaches of Finite Element Method.
2. Element Formulation, Boundary Conditions, Applied Forces, and Output Interpretations of
  - ! Truss Elements
  - ! Beam and Frame Elements
  - ! Two-Dimensional Solid Elements
  - ! Axisymmetric Elements
  - ! Three-Dimensional Solid Elements
  - ! Plate and Shell Elements
3. Heat Transfer and Thermal Stress Analysis.

**GRADING:** Homework Assignments (20%), Labs (10%), Three Exams (15% Each), and Final Exam (25%).

**GRADE:** A(>90); B(>80); C(>70); D(>60)

**FINAL EXAM:** **5:40 - 7:30 PM, December 17 (Monday), 2001**

Note:

1. There will be a total of approximately six (6) homework assignments. Each student must do his/her own work. Group discussions are O.K., but the actual doing of the analysis and the preparation of report, etc. are the responsibility of the individual.
2. No makeup exam will be given. No late assignment will be accepted.