THE UNIVERSITY OF TOLEDO
DEPARTMENT OF CIVIL ENGINEERING
CIVE 6/8310-002 Finite Element Methods
2006 Fall Semester

Course Goals: Introduction of concepts and theory of finite element method and its application to engineering problems.

Required Textbook: A First Course in the Finite Element Method by Logan, 4th Edition, Thomson.

References:

- Introduction to Finite Elements in Engineering by Chandrupatla and Belegundu, 3rd Edition, Prentice-Hall.
- A First Course in the Finite Element Method by Bickford, Irwin/McGraw-Hill.
- Finite Element Analysis-From Concepts to Applications by Burnett, Addison-Wesley.
- Concepts and Applications of Finite Element Analysis by Cook, Malkus and Plesha, 4th Edition, Wiley.
- An Introduction to the Finite Element Method, 2nd Edition by Reddy, McGraw-Hill.
- The Finite Element Method - Volumes 1 and 2 by Zienkiewicz and Taylor, 4th Edition, McGraw-Hill.
- Finite Element Procedures by Bathe, Prentice-Hall.

Instructor: Dr. Azadeh Parvin
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Phone: 419-530-8134
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Lectures: 11:00-12:15 pm on Tuesdays and Thursdays
Location: Palmer Hall 3020
Instructor Office Hours: 4:15-5:15 pm on Tuesdays and Thursdays or by appointment

Course Topics:

- Matrix Algebra
- Introduction to Finite Element Method
- Stiffness (Displacement) Method
- One-Dimensional Elements such as Bar (Truss) Element
- Potential Energy and Variational Methods
- Beam Element
- Analysis of Plane Frames
- Plane Stress and Plane Strain Stiffness Equations
- Practical Considerations in Modeling and Interpreting Finite Element Results
- Triangular Element
- Rectangular Element

Note that this is a tentative topic list and is subject to change. Any changes will be announced in class.

Course Grade:

- **Assignments: 25%** Text problems assigned in any week are due on Tuesday of the following week. Homework should be stapled with the answers highlighted. The solutions will be posted on the UT Distance Learning site. Computer assignments will utilize the SAP 2000 software package and be due on a specific date indicated on the assignment sheet. Grading for the assignments may be on pass/fail basis.
- **Quizzes: 5%**
- **Term Paper and Presentation: 20%** Each student will conduct a literature review on a state-of-the-art topic relevant to the application of finite element method to civil engineering problem (approval of the selected topic area is required) and submit a written report based on that review. Additionally, each student will have a formal Microsoft Power Point presentation on the paper followed by a Q&A session. More specific guidelines will be provided at a later date.
- **Exams: 50%** There will be two 75-minute exams at 25% each.

Important Dates:

09/14/06	Thursday	Proposed and Prioritized Paper Topic Area(s) Due for Approval
09/28/06	Thursday	One Page Paper Abstract Due
10/05/06	Thursday	Exam 1
10/17/06	Tuesday	Fall Break
10/19/06	Thursday	Extended Paper Abstract Due
11/21/06	Tuesday	Exam 2
11/23/06	Thursday	Thanksgiving Holiday
11/28/06	Tuesday	Full Paper Due
12/30/06	Thursday	Student Presentations - Group #1
12/05/06	Tuesday	Student Presentations - Group #2