AE 822 Finite Element Analysis II Spring 2003

Section 23067, 5:35 – 6:50 MW, 209 Wallace Hall

Instructor: Dr. James Locke 207 Wallace Hall Office hours: 4 - 5 MW and by appointment

Required text: Reddy, J.N. *An Introduction to the Finite Element Method*, 2nd Edition. McGraw-Hill.

Course objective: To develop a detailed understanding of the finite element method for the formulation and solution of structural problems.

Major Topics:

1. Development of Finite Element Equations of Motion (2 weeks): variational operator, virtual work, potential energy, application to bars, beams, and 2-D elasticity elements
2. Plate Bending (4 weeks): virtual work, equations of motion, finite element model, combined bending and membrane, composite plate elements
3. Eigenvalue Problems (2 weeks): vibration frequencies and mode shapes, buckling loads and mode shapes
4. Nonlinear Analysis (4 weeks): plastic deformation, large deflection bending, beam analysis, plate analysis, postbuckling
5. Commercial Solvers (4 weeks): bar, beam, plate and shell elements and degrees-of-freedom, NASTRAN, ANSYS

Grades:

Homework	15%
Two exams	50%
Final exam	35%

Based on the above percentages, a weighted average grade will be calculated. An average of 90 or above is guaranteed an A, 80 or above at least a B, 70 or above at least a C, and 60 or above at least a D. There will be a "gray area" between each two letter grades. If you are in one of these gray areas, whether you get the higher or lower grade depends on your performance on the final exam and your performance with respect to the rest of the class.

Policies:

Academic Honesty: Dismissal from the University will be recommended as a result of cheating such as copying during an examination or copying homework. Working together on homework is acceptable.

Homework: Late homework will be accepted up to one week after the due date and will receive a maximum grade of 50%. However, if this privilege is routinely abused, it will be withdrawn. All homework problems will be due at the beginning of class. Problems will be graded in a random manner and returned. Use 8.5 by 11 inch paper, one side of the page, and box the solutions. Staple the pages together, fold them vertically, and on the outside put your name, the date, and the problem numbers.

Exams: All in-class exams will be closed-book plus one equation sheet. If you miss an exam without prior approval or a certified medical excuse, you will receive a grade of 0% on that exam. *No exceptions*. Exams missed with instructor approval will be dealt with individually.