Course AE/ME 6310

Spring 2015

TTh 12:30-1:50

Woolf Hall, Room 311

Instructor: Kent L. Lawrence Office: 300D Woolf Hall

Office Hours: 2:00-3:00 TTh or by appointment or any other times I'm in the office & free. Phone: 817.272.2019

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Teaching Assistant: Mayuri Patil Office: 323K WH TA Office Hours: 3-5 MW

Teaching Assistant: Aditya Raman Office: 323A WH TA Office Hours: 1-3 MW

Web site: http//:mae.uta.edu/~lawrence

Course Prerequisites: ME 5310 or MAE 4344 or permission of instructor.

Course Description: Modeling of large systems, composite and incompressible materials, substructuring, mesh generation, solids applications, nonlinear problems. Computational aspects of these problems are discussed.

Course Learning Goals/Objectives: Course goals include development of an understanding of advanced finite element methods and its application to engineering systems.

Attendance and Drop Policy: See UTA Graduate Catalog.

TENTATIVE SCHEDULE

Week - Topic

1 - Introduction, Fundamentals

2 - 2D Line, Triangular & Quadrilateral Elements

3 - Solids of Revolution, Isoparametric Formulations, Tetrahedra & Bricks

4 - Plate Bending (Shells)

5 - Computational Aspects

6 - Orthotropic Materials, Composites

7 - Error Estimation & Modeling Exam 1, 3-3-15

8 - Stress Stiffness & Buckling

9 - Nonlinear Problems

10 - Nonlinear Problems

11 - Formulation Techniques, Heat Transfer, Field Problems, Exam 2

12 - Structural Dynamics

13 - Special topics

14 - Special topics

15 - Special topics

Final Exam

Specific Course Requirements

Quizzes: None

Examinations: Exam 1, Exam 2, Final

Major Assignments

Homework: Assigned and due weekly

Labs: None

Research Papers: None

Excused Missed Exams: Scheduled during last week of classes.

Makeup Work: Half credit will be deducted for unexcused late (7 days) homework.

Makeup Work: No credit will be given for HW problems not properly documented.

Course Evaluation & Final Grade:

Homework - 25%, Exam 1 - 25%, Exam 2 - 25%, Final Exam- 25%

Student Evaluation of Teaching: Conducted near end of semester. Your lowest HW grade will be dropped if your submit proof of completing the course evaluation.

Home Work and Exam Procedures

1. Homework submissions

Submit your homework unfolded, stapled in the upper left corner, with a cover sheet that contains the following in the upper 1/4 of the page:

Your Name - Last, First

AE/ME6310

Date

Course Assignment Number and, if applicable, text problem number(s).

Each assignment should be considered an engineering task and documented accordingly. Work neatly, using one side of the paper only. Number, date, and put your initials in the upper right hand corner of each page. When the assignment calls for computer solution of problems, be sure to use the computer generated output to support your results not as a substitute for a report of your effort.

Provide a problem statement indicating what is known and what is to be found. Include a good sketch that shows dimensions, units, materials and their properties, loadings, supports, axis systems used, and when appropriate, member cross section shapes and dimensions.

FEM models should show loadings, boundary conditions, the type of element(s) used, the FEM program used, important node and element numbers.

The results should be summarized separately from the supporting calculations and any relevant conclusions drawn. Mark your results by underlining or drawing a box around the important final results. If you are comparing an FEM solution to another known solution, make a clear statement of how the results compare using per cent error or per cent difference calculations. Be sure to include the input data you used. If you are solving a series of problems, one set of input data is probably sufficient.

Remember, your work should stand alone; that is, another engineer should be able to reproduce your results using only the write-up you prepare.

2. Schedules

Unless otherwise noted, homework is due at the beginning of the class period on the published due date.

3. Exams

Exam 1 & Exam 2 will be an in-class exams, and the final exam will be a take-home exam.

If you wish to receive email at an address different from your UTA email address, join the me6310 LISTSERVE. See menu item 'Join Mail List'.

Emergency Exit Procedures:

Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, which is the stairwell found by turning right (approx west) upon exiting room 311 Woolf Hall. Another stairwell is located to the left. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist handicapped individuals.

Upated 1-7-15