Sample Syllabus for Introduction to Finite Element Method

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Reference Books:
Warren C. Young “Roark’s formulas for stress and strain”
Walter D. Pilkey “Peterson’s stress concentration factors”

Grading System: 2 midterm (25% each), Final (25%), Lab. Assignments(25%)  NO MAKE UP EXAM

D=55-64% D+=65-69% C=70-74% C+=75-79% B=80-84% B+=85-89% A=90%+

Class Section Topic  Class-Problems  Home Problems

1 B.11 & B1.6 Introduction
2 Mechanics of Materials Review
3 Mechanics of Materials Review
4 N 7.0-7.3 Energy MethodsEnergy Methods  7.3,7.4
5 N7.4 Virtual Work  7.7  7.1,7.2,7.5
6 N 8.1 Rayleigh-Ritz  8.2
7 N 8.1 Rayleigh-Ritz  8.6  8.3,8.5
8 N8.2 FEM: Lagrange Polynomials
9 N8.3,B2.1-2.2 Axial Elements  8.8  8.9,8.11
10 N8.3-8.4 Axial Elements, Shaft Elements  8.10  8.13,8.15

EXAM 1

11 N8.5,B2.3-2.5 Symmetric Beam Element  8.23  8.21,8.24
12 N8.5,B2.3-2.5 Symmetric Beam Element
13 N8.6,B3.1-3.4 FEM 2-D
14 N8.6,B3.8-3.10 FEM 2-D
15 B4.1-4.3 Storage and Solution
16 B4.4 -4.7 Isoparametric elements, Numerical Integration
17 B4.8-4.12 Convergence, Patch Test
18 B5.1-5.4,5.6-5.10 Modeling, Error in Analysis, Mesh Refinement
19 B6.1, 6.4 Solids of Revolutions

EXAM 2

20 B7.1-7.2,7.4 Plate and Shell elements
21 B6.2 3-D Elements
22 B8.1,8.2 1-D Heat Conduction/ Thermal stresses
23 B8.3 2-D Steady state heat transfer
24 REVIEW

FINAL

Lab Number Instructional Lab. Assignment Lab

1. September 12th September 21st
2. September 26th October 3
3. October 10th October 17th
4. October 24th November 3rd
5. November 7th November 14th
6. November 28 December 5th

1. Attendance in Lab is 20% of your report grade unless excused by Vable. Lab Assignment reports due in class on Monday after the Lab. assignments. 10% per day deduction for late assignments.