CEE-711/811 = ME-635 = AE-640 = MSIM-795/895 FINITE ELEMENT - I

Fall'2010 Semester (Wed.; 04:20pm - 07:00pm; 217 GORNTO); Televised Class

Dr. Nguyen's 1-st Week Lecture (September 01, 2010; Wed.; 4:20pm-7:00pm)
Chapter 1 = Dr. Nguyen's materials from his own referenced book
Variable Banded, Skyline Storage Schemes, Assembling Procedures, Cholesky Method; General Treatment of Boundary Conditions

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Dr. Nguyen's 2-nd Week Lecture (September 08, 2010; Wed.; 4:20pm-7:00pm)
Chapter 1 = Dr. Nguyen's materials from his own referenced book
General Treatment of Boundary Conditions, Reason(s) for including "extra" zero(s) on a certain row's variable bandwidth ?

Chapter 2 = Dr. J.N. Reddy's power point presentation materials
Collocation method, least squares method, weighted residual methods: Petrov Galerkin, Galerkin, Ritz methods
How to identify "geometric" v.s. "natural" boundary conditions (from MATH view point) ??
How to identify # unknowns (or dof's) per node (for 1-D, 2-D, or 3-D "generic" engineering problems) ??

Chapter 3 = Dr. J.N. Reddy's power point presentation materials
FEA of a 1-D Model Problem (with a single variable) Weak Form

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Dr. Nguyen's 3-rd Week Lecture (September 15, 2010; Wed.; 4:20pm-7:00pm)
Chapter 3 = Dr. J.N. Reddy's power point presentation materials
FEA of a 1-D Model Problem (with a single variable)
Weak Form, Bilinear & Linear Form, Variational Problem, Quadratic Functional,
Finite Element Equations, Examples #1 and #2,

Dr. Nguyen's 4-th Week Lecture (September 22, 2010; Wed.; 4:20pm-7:00pm)
Chapter 3 = Dr. J.N. Reddy's power point presentation materials
FEA of a 1-D Model Problem (with a single variable)
Using Prof. Reddy's ppt to explain the "similarities & differences" between "Ritz versus Finite Element" procedures.

Refer to "More Examples" presentation materials
Using the weak (Galerkin) formulation to derive/obtain the Bilinear & Linear operators arised from a 2-dimensional heat transfer problem.

How to obtain "finite element shape functions" of 2-D triangular (w/wo extra interior nodes), 2-D rectangular element, 2-D quadrilateral element, 3-D brick/tetrahedral element, preserving symmetry, etc...

Bilinear & Symmetric for operator B9w,u), and linear for operator l(w) and construction of the associated quadratic functional.

Then, refering to another 1-D ODE problem with 2 different set of given boundary conditions to explain about "NON-HOMOGENEOUS" boundary conditions.

Dr. Nguyen's 5-th Week EXAM (September 29, 2010; Wed.; 4:20pm-7:00pm)
