MEC 455/530 - APPLIED STRESS ANALYSIS
Spring Semester 2011
http://me.eng.sunysb.edu/~mec455

Credit: 3 credits
Prerequisite: MEC 363

Lectures: Mon/Wed 3:50 – 5:10PM at Psychology A146
Instructor: Toshio Nakamura, (toshio.nakamura@sunysb.edu)
Add MEC455 or 530 in subject line when emails are sent

Office Hour: Mon, Thu 1:30 – 3:30PM at Light Engineering 137
TA: ?

Text / Primary Reference Book:

Other Related Books:
- Textbook for MEC363 (textbook for MEC410 is also useful).
- I-DEAS Master Series: Student Guide.

Homework: Homework and/or computer assignments are given about every week.

Exams: Two mid-term tests will be given (in March & April). No final exam.

Project: Final computer project using I-DEAS and written report will be required (Due 5/18/2009)

Grading: Homework (including computer assignments) 30%
Two Mid-Term Tests 40%
Finite Element Course Project 30%

Goals: The course is designed to learn the fundamentals and various solution techniques for structural problems including analytical methods and finite element analysis for stress and deformation studies.

Topics:
Review of Stresses and Strains, Vectors and Tensors with Indicial Notation (chap 1).
Energy Formulation – fundamentals of FEM, minimum potential energy
Finite Element Formulations – interpolation functions (chap. 9).
Stress, Deformation and Strain – equilibrium and compatibility (chap 2).
Material Behavior – constitutive equations, strain energy (chap2).
Simple Elastic Problems – axial loading, thin-walled cylinder (chap. 3)
2-D Elasticity – plane stress and plane strain, Airy stress function (chap. 3, 4, 5).
FE Modeling and Mesh Design – symmetry, discretization, B.C.s. (chap. 10)
Strength and Failure – fracture and plasticity (chap. 7)
Statement on Academic Dishonesty

Academic dishonesty is an extremely serious offense and will not be tolerated in any form. Academic dishonesty in general is the presentation of intellectual work that is not originally yours. Examples include, but are not limited to, copying or plagiarizing class assignments including homework, reports, designs, computer programs, and other submitted materials; copying or otherwise communicating answers on exams with other students; bringing unapproved aids, either in physical (written) or electronic form to an exam; obtaining copies of an exam prior to its administration, etc. Academic dishonesty violates both the ethical and moral standards of the Engineering profession and all infractions related to academic dishonesty will be prosecuted to the fullest via the CEAS CASA committee. For you, the honest student, academic dishonesty results in lower class curves, hence a depression in your GPA and class standing, while cheapening the degree you earn.”

Calculator Policy

Only the following calculators will be permitted to be used on all midterm and final exams in the Department of Mechanical Engineering. There will be no exceptions! This list of calculators is identical to that allowed for the National Council for Examiners for Engineering and Surveying (NCEES) Fundamentals of Engineering (FE) exam that many of you will take in your senior year, as well as Professional Engineering (PE exam) that you may take several years from now.

NCEES allowed calculators

Casio: All fx-115 models. Any Casio calculator must contain fx-115 in its model name.
Hewlett Packard: The HP 33s and HP 35s models, but no others.
Texas Instruments: All TI-30X and TI-36X models. Any Texas Instruments calculator must contain either TI-30X or TI-36X in its model name.

From www.ncees.org/exams/calculators/