MEC 539: Introduction to Finite Element Methods, Spring 2010

Professor: Dr. Noah D. Machtay PhD, 148HE, (631) 632-9014, nmachtay@ic.sunysb.edu
Office Hours: TBA
Lectures: Tuesday, 5:20-8:20pm, Earth and Space 069

Optional References:

Course Summary: Theory of finite element methods and their application to structural analysis problems. Matrix operations, force and displacement methods. Derivation of matrices for bars, beams, shear panels, membranes, plates, and solids. Use of these elements to model actual structural problems. Weighted residual techniques and extension of the finite element method into other areas such as heat flow and fluid flow. Programs for the solution of force and displacement method problems are configured. A computer project consisting of the solution and evaluation of a structural problem is required.

Cell Phones: Cell phones **must** be turned off during lectures. Phones that ring during a lecture become the property of the instructor. Students who wish to retrieve the SIM card from their phone must do so **prior** to confiscation. A cell phone that rings or is otherwise found to be active during an exam (voice, text, email, lights, sounds, vibrations, etc.) will result in ejection from that exam without a grade.

Grading: ABCF, Project/Assignments 25%, Midterm 25%, Final 40%, Class Participation 10%

Project: The project will be discussed in depth later in the semester. It will involve the creation of an **original** computer program, and the use of that program to solve an assigned problem using the Finite Element Method. Students will need a basic functional understanding of a programming language, and the tools to write, compile, and execute their project program. The specifics of programming will not be covered as part of this class. The project will **not** involve the use of a preexisting software package.

Assignments: Homework assignments will be offered for the benefit of the students, and may be collected and graded as necessary. Students must complete all assignments in a timely fashion in order to maximize the benefit of subsequent in class discussions.

Exams: Exams will be closed book, closed notes, and will not require or allow the use of a calculator, unless otherwise stated prior to the exam date (in which case the department calculator policy printed below would be in effect). Exam dates to be announced. Make-up exams will not be given unless agreed upon **prior** to the exam date, and only truly exceptional circumstances will be considered.

Class Participation: Students are expected to ask and answer questions in such a manor as to effectively demonstrate an understanding of the material. Any in-class assignments or unannounced quizzes will fall into this category, and as such no make-ups will be given. Students must be prepared for class, which includes the completion of any assignments that are to be discussed during the lecture.
Americans with Disabilities Act
If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room 128, (631) 632-6748. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential. Students requiring emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information, go to the following web site:
http://www.ehs.sunysb.edu/fire/disabilities/asp.

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, 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.

Allowed Calculators
Following the Mechanical Engineering Department’s mandatory calculator policy, only the following calculators will be allowed to be used on the midterm and final exams. 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 the Professional Engineering (PE) exam that you may take several years from now. The sooner you become comfortable on one of these calculators, the better. If you have any questions on this policy please feel free to contact me. The NCEES policy on calculators can be found here: http://www.ncees.org/exams/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.