MEC 101
ENGINEERING COMPUTING AND PROBLEM SOLVING I
Fall 2010

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Description

Computer integrated introduction to engineering design and analysis. The mechanical engineering profession, engineering ethics, and engineering impact on society. Engineering equations, graphs, dimensional analysis, curve fitting, optimization in engineering design. Introduction to vectors and engineering statics, failure, and materials selection. Use of spreadsheets and MATLAB

Lectures

Mon and Wed 5:20-6:40pm (Javits 102)
Although, I do not require you to attend classes, it is important that you don’t miss them. If you do miss a class, you are still responsible for finding out what was covered in that class and get lecture notes from your class-mates. Historically, students missing lectures consistently have done poorly in this class.

Rules for the lectures:

1. As a courtesy to other students, please don’t walk out of a lecture once you are in the class or talk to your class-mates.
2. Turn your cell phones/pagers off before a class begins.
3. No computer, cell phone, ipod, iphone, or any other device that can potentially distract your class-mates should be used during lectures.

Texts:

- Introduction to MatLab 7 by Etter, Kuncicky and Moore, Pearson Prentice Hall

*These books should be available for purchase or rent at the campus bookstore, however, you may also be able to find it cheaper online by using a price comparison search engine, such as addall.com or bestwebbuys.com*

Website: http://blackboard.stonybrook.edu
Grading: Homework 25%, Project 10%, 1 Midterm 25%, and Final 40%

• All exams will be scheduled in class, unless otherwise stated

• If you miss an exam due to unforeseen events, you will have to provide me a proof of the reason, such as doctor’s certificate for a medical emergency or death certificate for death in family before I will give you a makeup exam. There will be no make-up exams for reasons that I deem are or were within your control. Thus, this rules out reasons such as pre-arranged vacation, travel, conflict with other exams or engagements. An exception to this is the student athletes who are to provide me with their playing schedule for the semester within first week of the class.

Homework: Homework will be either assigned in the class or posted at blackboard. You can access Blackboard at: http://blackboard.sunysb.edu. If you have never used Stony Brook's Blackboard system, your initial password is your SOLAR ID# and your username is the same as your Stony Brook (sparky) username, which is generally your first initial and the first 7 letters of your last name. For help or more information see: https://tlt.stonybrook.edu/StudentServices/BbStudents/Pages/default.aspx For problems logging in, go to the helpdesk in the Main Library SINC Site or the Union SINC Site, you can also call: 631-632-9602 or e-mail: helpme@ic.sunysb.edu

Homework must be turned in at the beginning of the class on the specified due date. No late homework will be accepted in any case. I will drop the lowest HW grade. Please adhere to the following guidelines for submission (Not following these guidelines will result in deduction of points by the grader)

1. Homework will be accepted only on regular A4/letter sized white paper. This rules out papers torn apart from your notebook or diary.

2. Staple neatly in top left corner. I don’t bring a stapler to the class, so please don’t ask for it.

3. Write your name and ID in the top right corner of the first page.

4. Homework will be accepted only during class, at the beginning of the lecture.

Expectations

1. Communication

I use email and blackboard exclusively to communicate with you, and therefore, it is your responsibility to make sure that your email id is a current one on the blackboard system. I send a test email to everyone before the first class. If you do not receive it, check your settings in blackboard or your junk/spam box. I suggest that you use a university email id for this class; it is free and official. I am not responsible for the emails not delivered to your free/paid commercial email accounts. You can change your email address in blackboard yourself. Please do not ask me to do it for you. See the following link for details on how to change your email address at blackboard: https://tlt.stonybrook.edu/StudentServices/BbStudents/Pages/NavigatingBb.aspx#email
If you have an administrative or grading of HW related question, please email the T.A. first. If the T.A. is not able to provide a satisfactory answer, then only let me know.

2. Fundamentals
   Even though, this class has no pre-requisites, from your high school level classes, you should have acquired a working knowledge of basic Trigonometry (sines, cosines, basic trigonometry formula, etc.), Geometry, and basic Physics.

Midterm: Oct 28, 2010 5:20-6:40 PM in class
Final Exam: Monday, December 20, 2010 2:15-4:45 PM

Topics:
- Overview of the engineering profession, engineering disciplines and functions, ethical conduct and societal impact.
- Units and conversions, engineering equations, dimensional consistency, graphs. Integrated with spreadsheet usage.
- Graphical, algebraic, and numerical solutions to scalar equations. Spreadsheet usage and introduction to MatLab. Examples taken from engineering systems.
- Optimization in engineering design. Cost and safety considerations. Extrema, derivative as “black box” gradient operator (MatLab).
- Role of experiments in engineering, dimensional analysis and experimental design, curve fitting (MatLab).
- Solving systems of linear equations, matrices and vectors as mathematical elements (MatLab).
- Vectors as physical elements, introduction to engineering statics (2D), balance of forces and moments, solving large statically determinant systems with Matlab
- Material behavior and failure under uniaxial loads, stress and strain, material selection, tensile and compressive failure in structural members
- Fluid Flow around structures, Drag and Lift forces

Calculator Policy

Effective Spring, 2009 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 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.

NCEES Allowed calculators as of Spring 2009:
- 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.
The NCEES policy on calculators can be found here: http://www.ncees.org/exams/calculators/

Academic Conduct and Integrity

The campus policies on academic honesty are available on the Web (http://naples.cc.sunysb.edu/CAS/ajc.nsf/pages/info). 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, graphics, 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.

Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/uaa/academicjudiciary/

Special Note on ADA

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.