

wb1443

MATLAB in Engineering Mechanics

Fall Term 2014 (Q2), Thu 15:45-17:30, CT-CZ A, 2 ECTS credits

Instructor:

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Introduction

MATLAB in Engineering Mechanics is an introductory course in technical computing, MATLAB, and numerical methods. The emphasis is on informed use of mathematical software. We want you to learn enough about the mathematical functions in MATLAB that you will be able to use them correctly, appreciate their limitations, and modify them when necessary to suit your own needs.

By the end of the course you will be competent at writing your own MATLAB code to solve a technical computing problem in Engineering Mechanics on graduate level.

Course material

The course topics are:

- introduction to MATLAB
- linear equations
- root finding
- least squares
- ordinary differential equations
- fourier analysis
- eigenvalues and singular values

The course text is the book by Cleve Moler, 'Numerical Computing with MATLAB,' SIAM, 2004. An electronic edition published by The MathWorks is available *for free* at:
<http://www.mathworks.com/moler/chapters.html>.

There exist a plethora of books on MATLAB. One of the books I particular like (and know) is by Rudra Pratap, 'Getting Started With MATLAB 6,' Oxford University Press, 2002.

Homework

There will be weekly homework assignments and a final project. The homework is due a week after hand out and will be graded. Hand in your homework at the start of class at the front. Graded homework can be picked up (next week) at the end of class or at the TA's office. In doing the homework I encourage you to work together. To get credit, on every homework assignment please do the following things:

1. On the top right corner neatly print the following, making appropriate substitutions as appropriate:

Sally Rogers, # 9123456
HW set 1, Due Aug 31, 2004
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2. At the top clearly acknowledge all help you got from Faculty, students, or ANY other source (but for lecture and text). Examples could be "Mary Jones pointed out to me that I needed to draw the second FBD in problem 2." or "Nadia Chow showed me how to do problem 3 from start to finish." or "I basically copied this solution from the posted solutions." etc. If the TA thinks you are taking too much from other sources he/she will tell you. In the mean time don't violate academic integrity rules: be clear about which parts of your presentation you did not do on your own. More on academic integrity see:
<http://cuinfo.cornell.edu/Academic/AIC.html>
3. All computer output should have your name clearly visible, as printed by the computer (e.g., title plots with your name, put your name in a comment in the first line of any .m files, etc.)
4. Your work should be laid out neatly enough to read by someone who does not know how to do the problem. Part of your job as an engineer is not just to get the right answer, but convincingly so. That is your job on the homework as well.

When in doubt about these rules and regulations, please contact me.

The final project is an individual choice from various fields of application like: Multibody System Dynamics with MATLAB, Control Theory with MATLAB/Simulink, or Finite Element calculations with FEMLab. These will be presented at the last class. After handing in the report on the final project you make an appointment for the oral exam which is mainly on the final project and the assignments.

Web Site

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