The University of Texas at Tyler  
Department of Mechanical Engineering  

MENG 2201 – Mechanical Engineering II

Credits: 1 hours lecture, 3 hours laboratory per week

Instructor: Syed Hasan, Adjunct Professor of Mechanical Engineering

Text(s): McGraw-Hill Custom Textbook  
Additional Material: Class handouts

Course Information

Catalog Description: An introduction to computer based problem solving in mechanical engineering. Excel, Mathcad, and Matlab software tools are used for data analysis, equation solving, plotting and graphing, matrix operations, and an introduction to object oriented programming.

Prerequisites: MATH 2413 (Calculus I)

Required, Elective, Selected: Required

Course Goals

Instructional Outcomes: By the end of this course students will be able to:

1. Use Excel, Mathcad, and Matlab to solve problems that require mathematical manipulations
2. Create engineering graphs using Excel, Mathcad, and Matlab
3. Write Matlab script files that include input/output, control structures, looping, arrays, and functions
4. Perform a simple analysis of numerical data including mean, mode, median, standard deviation, linear regression and correlation using Excel, Mathcad, and Matlab
5. Find the roots of linear and non-linear equations using Excel, Mathcad, and Matlab
6. Perform simple matrix operations using Mathcad and Matlab
7. Solve system of linear equations using Excel, Mathcad, and Matlab
8. Numerically and/or symbolically integrate several different types of equations using Mathcad and Matlab

Relationship to Student Outcomes: This course supports the following Mechanical Engineering Program Student Outcomes, which state that our students will:
1. be able to apply science, mathematics, and modern engineering tools and techniques to identify, formulate, and solve engineering problems

6. pass the Fundamentals of Engineering examination.

Topics Covered

- Excel: Entering and formatting data; formulas and functions, including statistical, trigonometric, and matrix functions; charts and trendlines; performing data analysis, including descriptive statistics, histograms, using Goal Seeker and Solver.

- Mathcad: Units conversions, equation solving, Mathcad functions, matrix operations, graphing, statistical functions, curve fitting, simple programming, symbolic operations, introduction to numerical techniques.

- Matlab: programming elements, arrays and matrix operations, plotting and graphing, introduction to object-oriented programming.

Prepared By: Syed Hasan

Date: 09/01/15