MEEN 3250.002 – Analytical Methods for MEE Engineers  3 hours  Spring 2016

Instructor:  
Dr. Mark Wasikowski  
Mark.Wasikowski@unt.edu  
TuTh 4-5:20 PM, Room: NTDP D215  
Office: TBD  
Office Hours: by appointment

Required Text:  
Advanced Engineering Mathematics, 5th edition  
Dennis Zill and Warren S. Wright  

Pre-requisite: MATH 3410 Differential Equations 1  
Pre-requisite: MEEN 2240 Programming for MEE

Catalog Course Description: Applications of math models and computational techniques to typical engineering problems. Topics include analysis of linear systems, numerical integration of ordinary differential equations, conditions for optimality and introduction to finite elements.

Course Objectives: Upon successful completion of this course, students will be able to:
- Vectors and operations in 2D and 3D space to solve mechanical engineering problems: statics and dynamics
- Calculate vector integrals: line integrals, surface integrals and volume integrals
- Use integrals to measure areas, calculate fluid pressure, compute volume, center of mass, and mass moment of inertias
- Find roots for algebra equation using Iterative and Newton’s method
- Understand Lagrange, Newton and Spline interpolation method
- Find numerical value for integration using Trapezoidal and Simpson’s method
- Solve linear equations using Gaussian elimination method
- Solve 1st ODE using Euler method and RK method, Solve higher order ODE using Euler method and RK method
- Solve ODE boundary value problems (BVP)

ABET Criteria: MEEN 3250 addresses the following ABET program outcomes: a) Apply knowledge of mathematics, engineering and science and e) Identify, formulate and solve engineering problems

Topics to be Covered (topics may or may not be covered depending on time available): Vector algebra/calculus, Line integrals, Surface integrals, Vector Calculus, Green’s theorem, Stoke’s theorem, Differential Equations, Linear Algebra and Matrices, Numerical methods.

Course Format: “Chalk-n-Talk lecture style”, group discussion and problem solving

Grade Evaluation:
Homework:  10%  A = 90-100%
Quizzes  20%  B = 80-89%
Exam 1; 2/16  20%  C = 70-79%
Exam 2; 4/5  20%  D = 60-69%
Final; 5/5 (early)  30%  F = < 60%
No curve. A final average of 90.00 or higher is an A; 89.8 is a B. Exam/quiz re-grade requests must be made day returned. Once class dismissed requests not accepted.
It should be noted that entire quiz/exam will be re-graded, which may result in a lower score than originally assigned. Make-ups only for University-excused absences, given at semester end. Documentation required.

Assignments/Quizzes:
Homework problems assigned often and due the following week. Late homework not accepted. Homework turned in to office not accepted. There will be several quizzes. Lowest one is dropped. Make-up quizzes are NOT allowed.

Disability Policy: Reasonable accommodation will be made to facilitate special needs. If special accommodations are required, student must meet with Office of Disability Accommodation (ODA), (940) 565-4323. After that meeting, please contact me to discuss what accommodations will be necessary. For more information, see http://www.unt.edu/oda.

Academic Dishonesty:
Each student is expected to complete his/her own work. Cheating of any kind on the quizzes and exams will not be tolerated and will result in a score of zero for that assignment.