George Mason University
Department of Systems Engineering

SYST 500 / CSI 600 **Fall 2013**
Quantitative Methods for Systems Engineering, Operations Research, and Computational Science
Instructor: Dr. Tom Clemons; tclemons@gmu.edu
Room: Robinson B222

Description:
This course is designed to provide the basic quantitative foundations that students need to pursue a graduate program in Systems Engineering, Operations Research, and Computational Science. Topics include vector and matrices, differential equations, Laplace transforms and probability theory. A brief review of calculus and complex numbers will also be provided. The course will require computational work using the software *Matlab*, available on the GMU computer systems, online, or through purchase.

Pre-requisites: MATH 203 (Matrix Algebra)
MATH 113 (Analytic Geometry and Calculus I)
MATH 114 (Analytic Geometry and Calculus II)

Text: Advanced Engineering Mathematics (7th Ed.) by Peter O'Neil
ISBN-10: 1111427210; ISBN-13: 9781111427412
Software: Matlab+Simulink R2011A, Student Version, 11th edition
ISBN-10: 0-982-58383-4; ISBN-13: 978-0-982-58383-8

Policy: All work is to be done individually. All students must abide by the GMU Honor Code. Homework is due at the beginning of class, one class period from the date assigned, unless otherwise indicated. Late homework will not be accepted.
Class website: login to Blackboard and click on this course (http://mymason.gmu.edu)

Class outline:

Lesson 1	Tuesday 8/27	Introduction, Calculus / Complex Number Review		
Lesson 2	Tuesday 9/3	First-order differential equations	Chp 1	HW 1 due
Lesson 3	Tuesday 9/10	Higher-order differential equations	Chp 2	HW 2 due
Lesson 4	Tuesday 9/17	Laplace transforms and Fourier Series	Chp 3	HW 3 due
Lesson 5	Tuesday 9/24	Power Series Solutions	Chp 21 & 4	HW 4 due
Lesson 6	Tuesday 10/1	Numerical Methods – MATAB basics	Chp 5	HW 5 due
Lesson 7	Tuesday 10/8	Vectors – Test review	Chp 6	HW 6 due
	Tuesday 10/15	**Columbus Day – No Class**		
	Tuesday 10/22	**MID-TERM EXAM** Lessons 1-6 (HWs 1-6)		
Lesson 8	Tuesday 10/29	Matrices and Linear Systems	Chp 7	HW 7 due
Lesson 9	Tuesday 11/5	Determinants and Inverses	Chp 8	HW 8 due
Lesson 10	Tuesday 11/12	Eigenvalues/vectors	Chp 9	HW 9 due
Lesson 11	Tuesday 11/19	Systems of Differential Equations	Chp 10	HW 10 due
Lesson 12	Tuesday 11/26	Probability and random variables	Web Site	HW 11 due
Lesson 13	Tuesday 12/3	Multiple random variables & Review	Web Site	HW 12 due Numerical project due
	Tuesday 12/10	**FINAL EXAM** Lessons 8-14 (HWs 7-13)		

Grading: Homework = 35%, Midterm Exam = 30%, Final Exam = 30%, Project = 5%
A/A-:100-93, 92-90%; **B+/B/B-**: 89-87, 86-83, 82-80%; **C+/C/C-**: 79-77, 76-73, 72-70%; **F**: < 70%