George Mason University
Department of Systems Engineering

SYST 500 / CSI 600 **Fall 2012**
Quantitative Methods for Systems Engineering, Operations Research, and Computational Science
Instructor: Dr. Tom Clemons; tclemons@gmu.edu

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 some computational work using the software *Matlab*, available on the GMU computer systems.

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:

Session 1	Monday 8/27	Introduction, Calculus / Complex Number Review		
	Monday 9/3	**Labor Day – No Class**		
Session 2	Monday 9/10	First-order differential equations	Chp 1	HW 1 due
Session 3	Monday 9/17	Higher-order differential equations (Pt 1)	Chp 2	HW 2 due
Session 4	Monday 9/24	Higher-order differential equations (Pt 2)	Chp 2	HW 3 due
Session 5	Monday 10/1	Laplace transforms and Fourier Series	Chp 3	HW 4 due
Session 6	Tuesday 10/9	Power Series Solutions	Chp 4	HW 5 due
Session 7	Monday 10/15	**MID-TERM EXAM** Sessions 1-5 (HWs 1-5)		
Session 8	Monday 10/22	Vectors	Chp 6	HW 6 due
Session 9	Monday 10/29	Matrices and Linear Systems	Chp 7	HW 7 due
Session 10	Monday 11/5	Determinants and Inverses	Chp 8	HW 8 due
Session 11	Monday 11/12	Eigenvalues/vectors	Chp 9	HW 9 due
Session 12	Monday 11/19	Systems of Differential Equations	Chp 10	HW 10 due
Session 13	Monday 11/26	Power and geometric series	Chp 21 & 23	HW 11 due
Session 14	Monday 12/3	Probability and random variables	Chp 26	HW 12 due
Session 15	Monday 12/10	Multiple random variables & Review	Chp 27	HW 13 due
Session 16	Monday 12/17	**FINAL EXAM** Sessions 7-15 (HWs 7-13)		Extra Credit due

Grading: Homework = 36%, Midterm Exam = 32%, Final Exam = 32%
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%