

# SYLLABUS

## SM233 Introduction to Applied Math with MATLAB

### Spring Semester 2007

Textbook: *MATLAB: An Introduction with Applications*, 2<sup>nd</sup> Ed., John Wiley & Sons, INC, 2005.

Module	Day/Date		Reading Assignment	PROBLEMS	NOTES	
<b>0. Introduction to MATLAB</b>	1	Mon	1/07	1.1-5: Intro to MATLAB Workspace	(22) 1a,2a,3a	
	2	Thu	1/10	1.6-7: Using Variables/ Applications	(23) 5a,6a,7a (24) 12-18	
	3	Fri	1/11	2.1-8: Creating Vectors/Arrays	(48) 1,3,5,9	
	4	Mon	1/14	2.9-10: Array Functions/Strings	(49) 11,12,13	
	5	Thu	1/17	3.1-6: Math Ops w/Arrays 3.7: Generation of Random Numbers	(73) 2,3,8 (74) 9,10	Quiz 1
	6	Fri	1/18	Applications/Project A	(76) 12, 13	
	<b>Mon 1/21 -- Martin Luther King Day</b>					
	7	Thu	1/24	4.1-4.5 Script Files 5.1-4: Two-Dimensional Plots	(104) 1,3,5 (135) 2,5,7	
	8	Fri	1/25	5.5-9: Specialized Plotting/Project B	(136) 11,14 Project A	Project A Due
	9	Mon	1/28	Applications	(136) 15,16,17	
	10	Thu	1/31	6.1-6: Functions and Function Files 6.8-10: Inline Functions/Examples	(159) 1,3	Quiz 2
	11	Fri	2/01	Applications/Project C	(159) 8,11,12	Project B Due
	12	Mon	2/04	7.1-3: Programming: Conditional Statements	(202) 1,2	
	13	Thu	2/07	7.4-5: Programming: Loops Applications	(202) 8, 11 (202) 6,10,19	
	14	Fri	2/08	Application – Markov Chains		Handout 1 Project C Due
	15	Mon	2/11	Application – Markov Chains		
	16	Thu	2/14	<b>TEST 1 – Programming Portion</b>		Open Book
17	Fri	2/15	<b>TEST 1 – Written Portion</b>		Closed Book	
<b>Mon 2/18 – Presidents Day</b>						
<b>I. Cryptography</b>	18	Tue	2/19	Project D Work		
	19	Thu	2/21	Shift Ciphers	L20 Notes	
	20	Fri	2/22	Attacking a Shift Cipher/Statistics of English	L21 Notes	
	21	Mon	2/25	Anagrams and One Time Pads	L22 Notes	
	22	Thu	2/28	Random Number Generators	L23 Notes	
	23	Fri	2/29	Affine Ciphers	L23 Notes	
	24	Mon	3/03	Project Work		
	25	Thu	3/06	Hill Ciphers/Project 1	L25 Notes	
	26	Fri	3/07	Project Work 1 Work		
<b>3/08-3/16 Spring Break!!</b>						
<b>II. Recursion/ Chaos</b>	27	Mon	3/17	Euler's Method	<a href="#">L27 Notes</a>	
	28	Thu	3/20	Improved Euler' Method	<a href="#">L28 Notes</a>	
	29	Fri	3/21	Systems of Differential Equations	<a href="#">L29 Notes</a>	Project 1 Due
	30	Mon	3/24	Higher Order Differential Equations	<a href="#">L30 Notes</a>	
	31	Thu	3/27	Universal Law of Gravity/Project 2	<a href="#">L31 Notes</a>	
	32	Fri	3/28	Project3 Work		
	33	Mon	3/31	Möbius Numbers	<a href="#">L32Notes</a>	
	34	Thu	4/03	Logistics Model, Cobwebs	<a href="#">L33Notes</a>	
	35	Fri	4/04	Newton's Method	<a href="#">L34 Notes</a>	Project 2 Due
	36	Mon	4/07	The Roots of One/Project 3	L35 Notes	
	37	Thu	4/10	Project Work		

<b>III. Probability Distributions Monte Carlo Simulations</b>	38	Fri	4/11	Normal Distribution Numerical Integration	L38 Notes	
	39	Mon	4/14	Binomial Distribution		
	40	Thu	4/17	Discrete Uniform Distribution Central Limit Theorem		
	41	Fri	4/18	SASMC		
	42	Mon	4/21	Monte Carlo Simulations	L42 Notes	
	43	Thu	4/24	More on Monte Carlo Simulations Monte Carlo Integration	L43 Notes	
	44	Fri	4/25	Project 4 Work	L44 Notes	
	45	Mon	4/28	Project 4 Work/SOFs		Project 3 Due