Syllabus Math 260
Semester II, 2010 (092)
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King Fahd University of Petroleum and Minerals
Department of Mathematics & Statistics

Course: Math 260 (Introduction to Differential Equations and Linear Algebra)

Text Book: Differential Equations and Linear Algebra, C. H. Edwards and D. E. Penny, Prentice Hall, Second Edition (2005).

Objectives: This course introduces elementary differential equations and linear algebra to students of Computer Science, Computer Engineering, System Engineering and Earth Sciences.

Course Description: Systems of linear equations. Rank of matrices. Eigenvalues and eigenvectors. Vector spaces, subspaces, bases, dimensions. Invertible matrices. Similar matrices. Diagonalizable matrices. Block diagonal and Jordan forms. First order differential equations: separable and exact. The homogeneous differential equations with constant coefficients. Wronskian. Non-homogeneous differential equations. Methods of undetermined coefficients and variation of parameters. Systems of differential equations. Non-homogeneous systems.

W	Date	Section	Topic	Homework	
1	Feb 20-Feb 24	3.1	Introduction to Linear Systems	2, 22, 24, 26	Part I: Linear Algebra
		3.2	Matrices and Gaussian Elimination	4, 8, 14, 28	
		3.3	Reduced Row-Echelon Matrices		
2	Feb 27-Mar 03	3.3	Reduced Row-Echelon Matrices	3, 10, 24, 35	
		3.4	Matrix Operations	3, 10, 20, 24	
		3.5	Inverse of Matrices	4, 12, 20, 28	
3	Mar 06-10	3.6	Determinants	2, 4, 12, 30, 40, 43	
		4.1	The Vector Space R^3	1, 6, 13, 16, 24, 26, 30	
		4.2	The Vector Space R^n & Subspaces	3, 8, 16, 19	
4	Mar 13-17	4.3	Linear Combination & Independence of Vectors	1, 6, 12, 17, 26	
		4.4	Bases & Dimension for Vector Spaces	3, 8, 13, 16, 22	
5	Mar 20-24	4.5	Row and Column Spaces	1, 7, 13, 15, 17, 25, 26	
		6.1	Introduction to Eigenvalues	2, 15, 24, 28, 36	
			Review (Exam-1)		
6	Mar 27-31		Review (Exam-1)		
			Exam -1 (Sund Mar 28) 6pm B54 (3.1 - 4.5)		
		6.2	Diagonalization of Matrices	2, 14, 25, 28	
7	Apr 03- 07	6.3	Applications involving Powers of Matrices	2, 10, 20, 26, 36	
		7.5	Jordan form (pp 454-457)		
8	Apr 10-14	7.5	Jordan form (pp 454-457)	37, 38, 41, 43	
		1.1	Differential Equations and Mathematical Models	2, 12, 22, 30, 36, 40	PartII: Differential Equations
		1.2	Integrals as General & Particular Solutions (page: 10-11)	4, 6, 15, 18	
	Apr 17-21	Midterm	Midterm Vacation	Midterm Vacation	
9	Apr 24-28	1.4	Separable Equations & Applications	1, 10, 24, 27, 33	
		1.5	Linear First-Order Equations	4, 12, 24, 28, 32	
			Review (Exam-2)		
10	May 01-05		Review (Exam-2)		
			Exam -2 (Sund May 2) 6pm B54 (6.1 - 1.5)		
		1.6	Substitution Methods & Exact Equations	2, 10, 22, 40, 60	
		2.4	Euler's Method	3, 7, 12	
11	May 08-12	5.1	Second-Order Linear Equations	1, 11, 16, 19, 25, 28, 44	
		5.2	General Solutions of Linear Equations	2, 8, 13, 24, 26	
12	May 15-19	5.3	Homogeneous Equations with Constant Coefficients	1, 4, 14, 22, 28, 33, 38	
		5.5	Method of Undetermined Coefficients	4, 12, 26, 32, 36	
13	May 22-26	7.1	First-Order Systems & Applications	2, 8, 13, 18, 21	
		7.2	Matrices & Linear Systems	2, 4, 12, 16, 20, 25	
14	May 29-Jun2	7.3	The Eigenvalue Method for Linear Systems	4, 9, 18, 24, 26	
		7.5	Multiple Eigenvalue Solutions		
15	Jun 5-9	7.5	Multiple Eigenvalue Solutions (contd.)	4, 10, 16, 28, 30	
			Review		
	Jun-19		Final Exam (sat 7pm) comperhenxive		