Math 260 Syllabus (022)

Dept. Math. Sci., KFUPM
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Course: Math 260 Introduction to Differential Equations and Linear Algebra (3-0-3)
Textbook: Differential Equations and Linear Algebra, C. H. Edwards and D. E. Penney, Prentice Hall 2001.
Objectives: This course introduces elementary differential equations and linear algebra to students of CCSE.
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.
Corequisite: Math 201.

Wk	Dates	Sec	Topics	Suggested Homework*
1	Feb 23-26	1.1 1.2	Differential Equations & Mathematical Models Integrals as General and Particular Solutions	2, 10, 21, 30, 34, 40 2, 6, 14, 22, 33
2	Mar 1-5	1.4 1.5	Separable Equations & Applications Linear First Order Equations	2, 12, 17, 24, 30
3	Mar 8-Mar 12	1.5 1.6	Linear First Order Equations (Contd.) Substitution Methods and Exact Equations	4, 10, 24, 26, 33 2, 8, 14, 22, 38, 47
4	Mar 15-19	3.1 3.2	Introduction to Linear Systems Matrices and Gaussian Elimination	4, 22, 24, 28 2, 8, 12, 28
5	Mar 22-26	3.3 3.4	Reduced Row-Echelon Matrices Matrix Operations	4, 8, 10, 20, 35 2, 10, 20, 29, 36
6	Mar 29-Apr 2	3.5 3.6	Inverses of Matrices Determinants	4, 14, 22, 26, 32 2, 4, 10, 20, 28, 50
Exam I. Sunday, March 30, 6:30 pm.				
7	Apr. 5-Apr. 9	4.1 4.2	The Vector Space R^3 The Vector Space R^n and Subspaces	2, 8, 12, 18, 22 2, 8, 16, 20, 28
8	Apr 12-16	4.3 4.4	Linear Combination and Independence Bases and Dimension for Vector Spaces	2, 6, 10, 20, 24 2, 8, 12, 18, 22
9	Apr 19-23	5.1 5.2	Second Order Linear Equations General Solutions of Linear Equations.	2, 12, 16, 19, 26 4, 10, 14, 24, 26
10	Apr 26-30	5.3 5.5	Homogeneous Equations with Constant Coefficients Undetermined Coefficients	2, 4, 24, 28, 34 4, 12, 26, 32
11	May 3-7	5.5 6.1	Variation of Parameters Introduction to Eigenvalues	48, 54, 57, 60 2, 16, 24, 30, 36
Exam II. Tuesday, May 6, 6:30 pm.				
12	May 10-14	6.2 6.3	Diagonalization of Matrices Applications involving Powers of Matrices	4, 16, 26, 28, 32 2, 10, 20, 34
13	May 17-21	7.1 7.2	First Order Systems & Applications Matrices and Linear systems	2, 6, 12, 18 4, 10, 14, 20, 23
14	May 24-28	7.3 7.5	The Eigenvalue Method for Linear Systems Multiple Eigenvalue Solutions	2, 6, 18, 26, 38
15	May 31-Jun 4	7.5	Multiple Eigenvalue Solutions (Contd.)	2, 11, 12, 16, 26
16	Jun 7		Review	