Department of Mathematics & Statistics, KFUPM

Math 202 Syllabus (081)

Dr. K. M. Furati

Course Title: Elements of Differential Equations

Textbook: A First Course in Differential Equations by D.G. Zill, 8th Ed.

Course Description: First order and first degree equations. The homogeneous differential equations with constant coefficients. The methods of undetermined coefficients, reduction of order, and variation of parameters. The Cauchy-Euler equation. Series solutions. Systems of linear differential equations. Applications.

Wk	Date	Sec.	Material	Homework
1	Oct 11−15	1.1	Definitions and Terminology	4, 7, 8, 9, 10, 13, 16, 20, 27, 28, 30
		1.2	Initial Value Problems	2, 12, 20, 22, 27
2	Oct 18−22	2.2	Separable Variables	8, 14, 20, 22, 23, 27, 45
3	Oct 25−29	2.3	Linear Equations	5, 13, 16, 18, 30, 37
		2.4	Exact Equations	2, 5, 8, 15, 25, 27, 29, 31, 42a, 43, 44
4	Nov 01−05	2.5	Solutions by Substitutions	4, 6, 10, 13, 18, 21, 26, 30
		3.1	Linear Models: Law of cooling and Series Circuits	13, 14, 15, 27, 29, 31
First Exam, Tue, Nov 11, 2008, bldg 54. Material: 1.1−3.1. Weight: 20%				
5	Nov 08−12	4.1.1	Initial and Boundary Value Problems	3, 10, 12, 13
		4.1.2	Homogeneous Equations	15, 21, 23, 28
6	Nov 15−19	4.1.3	Nonhomogeneous Equations	33, 36, 37(b,e)
		4.2	Reduction of Order	1, 3, 12, 14, 19
7	Nov 22−26	4.3	Homogeneous Linear Equations with Constant Coefficients	4, 9, 12, 15, 20, 34, 40, 49, 50, 51
		4.5	Undetermined Coefficients – Annihilator Approach	8, 13, 22, 24, 34, 41, 48, 64, 67, 73
8	Nov 29−Dec 02	4.6	Variation of Parameters	6, 11, 13, 24, 25, 28
		4.7	Cauchy-Euler Equation	3, 5, 10, 11, 14, 16, 19, 31, 34, 37, 39
Eid Vacation: Wed−Sat, Dec 3−13				
9	Dec 14−17, Thu Dec 18	6.1.1	Review of Power Series	1, 10, 11
		6.1.2	Solutions about Ordinary Points	15, 17, 20, 22, 32
10	Dec 20−24	6.2	Solutions about Singular Points	3, 10, 13, 14, 19, 20
11	Dec 27−31	A.II.1	Matrices: Definitions and Theory	14, 15, 19, 23
		A.II.2	Gauss Elimination	27, 29, 31, 33, 39, 43, 44
		A.II.3	Eigenvalue Problem	47, 49, 52, 53, 55
Second Exam, Tue, Dec 30, 2008, bldg 54. Material: 4.1−6.1. Weight: 25%				
12	Jan 03−07	8.1	Preliminary Theory	4, 5, 8, 14, 15, 17, 23, 25
		8.2	Homogeneous Linear Systems with Constant coefficients	
13	Jan 10−14	8.2.1	Distinct Real Eigenvalues	3, 7, 10, 13
		8.2.2	Repeated Eigenvalues	19, 21, 23, 25, 27
14	Jan 17−21	8.2.3	Complex Eigenvalues	33, 34, 36, 39, 41, 45
		8.3.2	Variation of Parameters	11, 12, 23, 32
15	Jan 24−28	8.4	Matrix Exponential	1, 2, 4, 5, 6, 8, 9
			Review	
S	Jan 31		Review	
Final Exam, Sat, Feb 7, 2009, 7:00 pm. Material: Comprehensive. Weight: 35%				