

## Math 202 Syllabus (063)

Dr. K. M. Furati

**Course Title:** Elements of Differential Equations

**Textbook:** A First Course in Differential Equations by D.G. Zill, 7<sup>th</sup> 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	July 01-05	1.1	Definitions and Terminology	2, 3, 4, 9, 10, 13, 20, 25, 26
		1.2	Initial Value Problems	2, 8, 16, 18, 23
		2.1	Solution Curves without a Solution	
		2.2	Separable Variables	8, 14, 20, 22, 23, 27, 45
2	July 07-11	2.3	Linear Equations	5, 13, 16, 18, 30, 36
		2.4	Exact Equations	2, 5, 8, 15, 25, 27
		2.5	Solutions by Substitutions	4, 6, 10, 13, 18, 21, 26, 30
		3.1	Linear Models	3, 8, 13, 14, 15, 23
3	July 14-18	4.1.1	Initial and Boundary Value Problems	3, 10, 12, 13
		4.1.2	Homogeneous Equations	15, 21, 23, 28
		4.1.3	Nonhomogeneous Equations	33, 36, 37(b,e)
		4.2	Reduction of Order	1, 3, 12, 14, 19
4	July 21-25	4.3	Homogeneous Linear Equations with Constant Coefficients	4, 9, 12, 15, 20, 34, 40, 53
		4.5	Undetermined Coefficients--Annihilator Approach	8, 13, 22, 24, 34, 41, 48, 64, 67, 73
		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
5	July 28-Aug 01	6.1.1	Review of Power Series	1, 10, 11
		6.1.2	Solutions about Ordinary Points	13, 16, 18, 28
		6.2	Solutions about Singular Points	3, 10, 13, 14, 19, 20, 27
6	Aug 04-08	A.II.2	Gauss Elimination	14, 15, 19, 23, 27, 29, 31, 33, 39, 43
		A.II.3	Eigenvalue Problem	47, 49, 52, 53, 55
		8.1	Preliminary Theory	4, 5, 8, 14, 15, 17, 23, 25
		8.2	Homogeneous Linear Systems with Constant coefficients	
7	Aug 11-15	8.2.1	Distinct Real Eigenvalues	3, 4, 10, 13
		8.2.2	Repeated Eigenvalues	19, 21, 23, 25, 27
		8.2.3	Complex Eigenvalues	33, 34, 36, 39, 41, 45
		8.3	Variation of Parameters	1, 2, 13, 22
8	Aug 18-20	8.4	Matrix Exponential	1, 2, 4, 5, 6, 8, 9
			Review	