King Fahd University of Petroleum and Minerals
Department of Mathematics & Statistics
Math 202 Syllabus (153)
Coordinator Jaafar Almutawa

Course Title:	Elements of Differential Equations
Credit:	3-0-3
Textbook:	A First Course in Differential Equations by D.G. Zill, 10th 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.

Learning outcomes:
At the end of this subject, students should be able to:

1. Define the terminologies which are commonly used in differential equations.
2. Verify that the given function is a solution to the given differential equation.
3. Differentiate between linear and non-linear, ordinary and partial and different degreed differential equations.
4. Identify and solve linear, exact, separable, and homogeneous differential equations.
5. Solve the problems of ordinary differential equations.
6. Apply the knowledge of differential equations in order to solve engineering problems.
7. Solve second-degree homogeneous linear equations with constant coefficients.
8. Solve second-degree non-homogeneous linear differential equations by the principle of superposition, undetermined coefficients, and by the method of variation of parameters.
9. Use series function to solve differential equations.
10. Use the Wronskian and characteristic equations to solve higher order differential equations.
11. Use Eigenvalue and Eigenvector to solve linear system of differential equations.

Grading Policy:

Exam I	Materials: 1.1-4.1.1 Date: Monday July 25, 2016	Place: BLD 54 Time: 6:30-8:30 PM	25% (100 points)
Exam II	Materials: 4.1.2-4.7 Date : Tuesday, August 9, 2016	Place: BLD 57 Time: 7:00 -9:00 PM	25% (100 points)
Final Exam	Material: Comprehensive Date: Tuesday, August 30, 2016	Place: 7:00 -10:00 PM Time:TBA	35% (140 points)
Class Work	Class Activities: It is based on quizzes, class tests, or other class activities determined by the instructor. Any quiz or test under class activity should be of written type and not of multiple-choice type. The average x (out of 60) of class activities of the sections taught by the same instructor should be in the interval [36,45].		15% (60 points)

Exam Questions:

The questions of the common exams are based on the examples, homework problems and the exercises of the textbook.

Missing one of the Two Common Major Exams-I or II:

No makeup exam will be given under any circumstance. When a student misses Exam-I or Exam-II for a valid reason (such as medical emergencies), his grade for this exam will be determined based on the existing formula which depends on his performance in the non-missing exam and in the final exam.

Attendance:

KFUPM attendance policy will be enforced. A DN grade will be awarded to any student who accumulates 9 unexcused absences.

Academic Integrity:
All KFUPM policies regarding ethics apply to this course.

Wk#	Date	Sec.	Material	Homework
1	July 11-14	1.1	Definitions and Terminology	5, 13, 14, 18, 20, 22, 29, 32, 36, 38
		1.2	Initial Value Problems	2, 6, 13, 19, 22, 24, 26, 30
		2.2	Separable Variables	6, 10, 12, 21, 26, 30, 32, 48
	July 16(Sat)	2.3	Linear Equations	4, 12, 15, 18, 20, 22, 28, 30, 36
2	July 17-21	2.4	Exact Equations	5, 8, 12, 20, 28, 30, 31, 34, 42(b), 43
		2.5	Solutions by Substitutions	2, 6, 8, 10, 12,16, 22, 25, 28, 29
		3.1	Linear Models	4, 8, 10, 15, 16, 18, 20
		4.1.1	Initial and Boundary Value Problems	2,4,6, 10, 12,13(c), 14(d)
Exam I: Mon, July 25, Material: (1.1-4.1.1), (6:30-8:30pm), Location :BLD 54				
3	July 24-28	4.1.2	Homogeneous Equations	16, 22, 24, 25, 28, 30
		4.1.3	Nonhomogeneous Equations	31, 34, 36 (b, c)
		4.2	Reduction of Order	4, 6, 10, 13, 16, 18, 19
4	July 31- August 4	4.3	Homogeneous Linear Equations with Constant Coefficients	5, 8, 12, 14, 18, 22, 28, 32, 36, 42, 49, 50
		4.5	Constant Coefficients Undetermined Coefficients-- Annihilator Approach	2, 8,14, 20, 25, 28,32,34, 44, 48, 50, 61, 64, 68, 71
		4.6	Variation of Parameters	2,6 11, 12, 18, 22, 24, 26, 28
		4.7	Cauchy-Euler Equation (both methods)	1,6, 8, 12, 16, 18, 22, 24, 29, 32, 36, 38, 40
Exam II: Tuesday, August 9, Material: (4.1.2 ─ 4.7), (7:00 -9:00 PM), Location: BLD 57				
5	August 7-11	6.1	Review of Power Series	2,3, 4, 8, 10, 12, 16
		6.2	Solutions about Ordinary Points	2,4,11,12,16,21,22
		6.3	Solutions about Singular Points	1,4,8,12,14,16,19,24,30,32
6	August 14-18	A.II.2	Matrices and Linear Systems (review)	12,18,22,23,26,30(d, g), 36,40,44
		A.II.3	Eigenvalue Problem	48, 49, 53, 54, 56, 59, 60, 61
		8.1	Preliminary Theory-Linear Systems	3, 6, 8, 10, 14, 15, 16, 19, 22, 24, 26
		8.2	Homogeneous Linear Systems	NA
7	August 21-25	8.2.1	Distinct Real Eigenvalues	2, 7, 9, 10,14
		8.2.2	Repeated Eigenvalues	22, 24, 26, 27, 29, 30
		8.2.3	Complex Eigenvalues	34, 37, 38, 42, 46
		8.3	Variation of Parameters	12, 14, 15, 28, 30, 31
8	August 28-29	8.4	Matrix Exponential (No Laplace Trans.)	2, 5, 6, 8, 9, 10, 12
			Review	
Final Exam : Tuesday, August 30, 2016, 7:00 PM. Material : Comprehensive.				