Title: Elements of Differential Equations.

Credit: 3-0-3
                    A First Course in Differential Equations by D.G.Zill, 10th edition, 2013
Textbook:

Description: First-order and first -degree differential equations. Linear Models.
                   Homogeneous differential equations with constant coefficients. Undetermined
                   coefficients (Annihilator Approach), reduction of order,
                   variation of parameters, and Cauchy-Euler equation.
                   Series solutions. Systems of linear first-order differential equations.

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

1.   Define the terminology which are commonly used in differential equations.
2.   Verify that the given function is a solution of the given differential equation.
3.   Differentiate between linear and non-linear, ordinary and partial and different degreed differential   equations.
4.   Identify and solve 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 the method of variation of parameters.
9.   Use the Wronskian and characteristic equations to solve higher order differential equations.
10.   Use Series Function to solve differential equations.
11.   Use Eigenvalue and Eigenvector to solve linear system of differential equations.

Grading Policy:

1. **Exam I**	**Materials: 1.1 --------4.1.2**	**Place:** Building 54	25% (100 points)
	Date: Monday, October 12	**Time: 06:00 pm**	
2. **Exam II**	**Materials: 4.1.3 -------- 6.1**	**Place:** Building 54	25% (100 points)
	Date: Thursday, November 5	**Time: 05:30 pm**	
3. **Final Exam**		**Place:** Building 57	35% (140 points)
	Date: Monday, December 21	**Time: 08:00 am**	
4. **Class Work**			
	ii) 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, recitation problems and the exercises of the textbook.

Missing Exam I or Exam II:

No makeup exam will be given under any circumstance. When a student misses Exam I or Exam II for a legitimate 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:

Attendance is a University Requirement. 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.

King Fahd University of Petroleum and Minerals

Department of Mathematics and Statistics

Math 202- Syllabus (Term 151)

Coordinator: Dr. Boubaker.S

Week	Dates (2015)	Sec.	Topics
1	Aug. 23- 27	1.1	Definitions and Terminology
		1.2	Initial Value Problems
2	Aug. 30- Sep. 03	2.2	Separable Variables
		2.3	Linear Equations
3	Sep. 06- 10	2.4	Exact Equations
4	Sep. 13- 17	2.5	Solutions by Substitutions
		3.1	Linear Models: Growth and Decay, Newton's Law of cooling
Sep. 20- 28: Id Al-Adha Vacation		
5	Oct 4- Oct. 8	4.1	Preliminary Theory: Linear Equations
		4.1.1	Initial Value and Boundary value problems
		4.1.2	Homogeneous Equations
		4.1.3	Nonhomogeneous Equations
6	Oct. 11- 15	4.2	Reduction of Order
		4.3	Homogeneous Linear equations with constant coefficient
		4.5	Undetermined Coefficients-Annihilator Approach
Exam I: Monday, October 12, 2015; 06:00 pm---08:00 pm		
7	Oct. 18- 22	4.6	Variation of Parameters
		4.7	Cauchy- Euler Equations (Both methods)
8	Oct. 25- 29	6.1	Review of Power Series
		6.2	Solutions about Ordinary Points
9	Nov. 1- 5	6.3	Solutions about Singular Points
		App I	Matrices and Linear Systems
Exam II: Thursday, November 5, 2015; 05:30 pm---- 07:30 pm		
10	Nov. 8- 12	App II	The Eigenvalue Problem
		8.1	Preliminary Theory- Linear System
11	Nov. 15- 19	8.2	Homogeneous Linear Systems
		8.2.1	Distinct Real Eigenvalues
12	Nov. 22- 26	8.2.2	Repeated Eigenvalues
		8.2.3	Complex Eigenvalues
13	Nov. 29- Dec. 3	8.3	Nonhomogeneous Linear System
		8.3.2	Variation of Parameters
14	Dec. 6- 10		Continued
		8.4	Matrix Exponential (No Laplace Transform)
15	Dec. 13- 17		Catch up and/or Review
Final Exam: Monday, December 21, 2015		

Homework

Section	Homework Problems
1.1	5,13,14,18,20,22,29,32
1.2	2,6,13,19,22,24,26,30,
2.2	6,10,12,21,26,30.32,48,
2.3	4,12,15,18,20,22,28,30,36
2.4	5,8,12,20,28,30,31,34,42,43
2.5	2,6,8,10,12,16,22,25,28,29
3.1	4,8,10,15,16,18,20
4.1.1	2,4,6,10,12,13,14
4.1.2	16,22,24,25,28,30
4.1.3	31,34,36 (b,c)
4.2	4,6,10,13,16,18,19
4.3	5,8,12,14,18,22,28,32,36,42,49,50
4.5	2,8,14,20,25,28,32,34,44,48,50,61,64,68,71
4.6	2,6,11,12,18,22,24,26,28
4.7	1,6,812,16,18,22,24,29,32,36,38,40
6.1	2,3,4,8,10,12,16
6.2	2,4,11,12,16,21,22
6.3	1,4,8,12,14,16,19,24,30,32
App I	12,18,22,23,26,30(d,g),36,40,44
App II	48,49,53,54,56,59,60,61
8.1	3,6,8,10,14,15,16,19,22,24,26
8.2.1	2,7,9,10,14
8.2.2	22,24,26,27,29,30
8.2.3	34,37,38,42
8.3.2	12,14,15,28,30,31
8.4	2,5,6,8,9,10,12

Tips on how to enhance your problem-solving abilities:
1. Please do all the homework assignments on time.
2. You are urged to practice (but not memorize) more problems than the above lists.
3. You should always try to solve a problem on your own before reading the solution or asking for help.
4. If you find it difficult to handle a certain type of problems, you should try more problems of that type.

5. You are encouraged to solve some of the review problems at the end of each chapter.
6. The practice you get doing homework and reviewing the class lectures will make exam problems easier to tackle.
7. Try to make good use of the office hours of your instructor.