King Fahd University of Petroleum and Minerals
Department of Mathematics & Statistics

Math 202 – Syllabus
2015-2016 (152)
Coordinator: Dr. Husain Al-Attas
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Title: Elements of Differential Equations.

Credit: 3-0-3

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

Description: First order and first degree differential 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:

1. Exam I	Materials: 1.1-4.1.1	Place: TBA	25% (100 points)
	Date: Monday February 22,2016	Time:TBA (In the evening)	
2. Exam II	Materials: 4.1.2-4.7	Place: TBA	25% (100 points)
	Date : Thursday March 31,2016	Time:TBA(In the evening)	
3. Final Exam	Material: Comprehensive	Place: TBA	35% (140 points)
	Date: Check Registrar's website	Time: TBA	
4. 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.

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Week#	Date	Text Sections	Topic	Suggested Review Exercises
1	January 17-21	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	January 24-28	2.2	Separable Variables	6, 10, 12, 21, 26, 30, 32, 48
		2.3	Linear Equations	4, 12, 15, 18, 20, 22, 28, 30, 36
3	Jan 31 – Feb 4	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
4	February 7 - 11	3.1	Linear Models: Growth and Decay, Newton's Law of Cooling	4, 8, 10, 15, 16, 18, 20
		4.1	Linear, Equations: Basic Theory	
5	February 14 - 18	4.1.1	Initial-Value and Boundary-Value Problems	2, 4, 6, 10, 12, 13(c), 14(d)
		4.1.2	Homogeneous Equations	16, 22, 24, 25, 28, 30
Major Exam I Monday February 22, 2016 In the Evening Material: 1.1-4.1.1				
6	Feb21 - 25	4.1.3	Nonhomogeneous Equations	31, 34, 36 (b, c)
		4.2	Reduction of Order	4, 6, 10, 13, 16, 18, 19
7	Feb28 - March 3	4.3	Homogeneous Linear Equations with constant coefficients	5, 8, 12, 14, 18, 22, 28, 32, 36, 42, 49, 50
		4.5	Undetermined Coefficients- Annihilator Approach	2, 8, 14, 20, 25, 28, 32, 34, 44, 48, 50, 61, 64, 68, 71
8	March 6 - 10	4.6	Variation of Parameters	2, 6, 11, 12, 18, 22, 24, 26, 28
Mid Term Vacation March 11-19, 2016				
9	March 20-24	4.7	Cauchy-Euler Equations(Both Methods)	1, 6, 8, 12, 16, 18, 22, 24, 29, 32, 36, 38, 40
Major Exam II Thursday March 31, 2016 In the Evening Material: 4.1.2-4.7				
10	March 27 - 31	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
11	April 3 - 7	6.3	Solutions About Singular Points	1, 4, 8, 12, 14, 16, 19, 24, 30, 32
		App II	Matrices and Linear Systems (review)	12, 18, 22, 23, 26, 30(d,g), 36, 40, 44
12	April 10 - 14	App II	The Eigenvalue Problem	48, 49, 53, 54, 56, 59, 60, 61
		8.1	Preliminary Theory-Linear System	3, 6, 8, 10, 14, 15, 16, 19, 22, 24, 26
13	April 17 - 21	8.2	Homogeneous Linear System	
		8.2.1	Distinct Real Eigenvalues	2, 7, 9, 10, 14
		8.2.2	Repeated Eigenvalues	22, 24, 26, 27, 29, 30
14	April 24 - 28	8.2.3	Complex Eigenvalues	34, 37, 38, 42, 46
		8.3	Nonhomogeneous Linear Systems	
15	May 1 - 5	8.3.2	Variation of Parameters	12, 14, 15, 28, 30, 31
		8.4	Matrix Exponential (No Laplace Transform)	2, 5, 6, 8, 9, 10, 12
	Final Exam Check Registrar's Website Material: Comprehensive			