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

SYLLABUS

Semester I: 2011-2012**(111)**

Coordinator: Dr. Muhammad Yousuf
Course #: MATH 202
Title: Elements of Differential Equations
Textbook: A First Course in Differential Equations by D.G. Zill, 9th Edition

Week	Date	Sec.	Topics	Suggested Homework Problems
1	Sep 10 – 14	1.1	Definition and Terminology	2, 4, 10, 14, 18, 20, 22, 24, 30, 32, 34, 38
		1.2	Initial-Value Problems	2, 4, 10, 14, 18, 22, 24, 28, 30
2	Sep 17 – 21	2.2	Separable Variables	8, 10, 12, 13, 20, 22, 24, 28, 30
		2.3	Linear Equations	6, 12, 14, 18, 20, 24, 28, 30, 32
3	Sep 24 – 28	2.4	Exact Equations	4, 6, 8, 15, 18, 26, 28, 30, 33, 36, 42(a), 43
		2.5	Solutions by Substitutions	2, 6, 8, 10, 12, 14, 18, 20, 22, 27, 28, 30
4	Oct 01 – 05	3.1	Linear Models: Growth and Decay, Newton's Law of Cooling	6, 8, 10, 14, 16, 18, 30, 32
		4.1	Linear Equations: Basic Theory	
5	Oct 08 – 12	4.1.1	Initial-Value and Boundary-Value Problems	4, 5, 7, 10, 12, 14
		4.1.2	Homogeneous Equations	18, 22, 24, 29, 30
First Exam: Tuesday Oct 11, 2011, 08:30 – 10:30 pm [1.1-4.1.1] (100 points = 25%)				
6	Oct 15 – 19	4.1.3	Non-homogeneous Equations	32, 34, 36
		4.2	Reduction of Order	2, 4, 8, 12, 14, 19, 20
7	Oct 22 – 26	4.3	Homogeneous Linear Equations with Constant Coefficients	6, 8, 10, 14, 18, 20, 26, 30, 34, 36, 40, 49, 50, 51
		4.5	Undetermined Coefficients – Annihilator Approach	6, 8, 12, 14, 22, 24, 26, 30, 32, 34, 40, 44, 48, 52, 60, 62, 68, 72
8	Oct 29 – 31	4.6	Variation of Parameters	4, 6, 10, 12, 14, 18, 20, 24, 26, 28
EID Vacation: Tue Nov 01 – Fri Nov 11, 2009				
9	Nov 12 – 16	4.7	Cauchy-Euler Equation (*Both Methods*)	4, 8, 14, 16, 18, 20, 24, 28, 32, 34, 38, 39
10	Nov 19 – 23	6.1	Solutions About Ordinary Points	
		6.1.1	Review of Power Series	1, 2, 4, 6, 10, 12, 14
Second Exam: Tuesday Nov 22, 2011, 08:30 – 10:30 pm [4.1.2 – 4.7] (100 points = 25%)				
11	Nov 26 – 30	*6.1.2*	Power Series Solution	16, 18, 20, 22, 24, 28, 30, 32, 34
		6.2	Solutions about Singular Points	3, 4, 6, 10, 12, 14, 18, 20, 22, 32
12	Dec 03 – 07	*App II*	Matrices and Linear Systems (*review*)	10, 14, 15, 19, 24, 27, 30, 32, 35, 39, 43
			The Eigenvalue Problem	47, 49, 52, 53, 54, 55, 59, 60, 61
		8.1	Preliminary Theory	4, 6, 8, 10, 14, 15, 16, 18, 22, 24, 26
13	Dec 10 – 14	8.2	Homogeneous Linear Systems	
		8.2.1	Distinct Real Eigenvalues	4, 8, 10, 13, 14
		8.2.2	Repeated Eigenvalues	20, 22, 24, 26, 27, 28, 30
14	Dec 17 – 21	8.2.3	Complex Eigenvalues	33, 34, 36, 39, 40, 42, 45
		8.3	Nonhomogeneous Linear Systems	
15	Dec 24 – 28	8.3.2	Variation of Parameters	11, 12, 14, 16, 23, 27, 30, 32
		8.4	Matrix Exponential (No Laplace Transform)	1, 4, 5, 6, 8, 9, 10, 12, 16
16	Dec 31 – Jan 02	---	Pace Adjustment	
			Review	
Final Exam: Monday, Jan 09, 2012, at 07:00 – 10:00 pm [Comprehensive] (140 points = 35%)				

- For remarks about Homework Problems and exams, see the following page.

Remarks and Policies

Homework:

- The selected homework problems indicate the levels of the breadth and the depth of coverage. To acquire proficiency on solution methods, the students are strongly urged to solve much more problems than indicated in the syllabus.
- In Sec. 8.4, problems 1, 5 and 9 refer to the same matrix. The same is true for problems 2 and 6 and problems 4 and 8. The matrix e^{At} is to be computed by the definition given in (3). The material on *Laplace Transform* in page 335 is *omitted*.

Review Material: In the introduction of each section in the textbook, *review material*, if any, is indicated. **Student** must do all reviews. Students should make a plan, based on the Syllabus, for all the reviews required for the course.

Exams:

- Any student **missing a major exam** with or without excuse **will not be given a Make-Up Exam**.

  However, a student missing an Exam with an official excuse from the "Deanship of Students Affairs" will be compensated according to the following policy.

  Exam Missed by the Student: Grade to be compensated := ExM, Ave of Exam: AveM

  Exam taken by Student: Grade obtained = ExT, Ave of Exam: Ave T

  Final Exam: Grade obtained:= ExT, Ave of Exam: Ave F

  ExM = AveM + [10(ExT-AveT)+14(ExT-AveF)]/24

- **Class Work (60 Points = 15%):** The policy on the class work will be determined by your course instructor and will be announced during the first week of the semester.

Attendance:

- Attendance is compulsory. KFUPM policy with respect to attendance will be strictly enforced.
- Any student accumulating **9 unexcused absences** will be awarded DN Grade in the course.

******Best Wishes for a Pleasant Semester******