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

SYLLABUS

Semester I: 2009-2010**(091)**

Coordinator: Dr. Muhammad Yousuf
Course #: MATH 202
Title: Elements of Differential Equations
Textbook: A First Course in Differential Equations by D.G. Zill, 8th Edition

Week	Date	Sec.	Topics	Homework
1	Oct 03 – 07	1.1 1.2	Definition and Terminology Initial-Value Problems	2, 4, 7, 9, 10, 14, 18, 20, 22, 27, 28, 32 2, 4, 8, 12, 22, 24, 28
2	Oct 10 – 14	2.2 2.3	Separable Variables Linear Equations	10, 12, 13, 20, 22, 24, 28 6, 12, 16, 18, 20, 24, 28, 32, 37
3	Oct 17 – 21	2.4 2.5	Exact Equations Solutions by Substitutions	4, 6, 8, 15, 26, 28, 30, 33, 42(a), 43, 44 2, 6, 8, 9, 14, 18, 22, 26, 28, 30
4	Oct 24 – 28	3.1 4.1 4.1.1	Linear Models: Newton's Law of Cooling and Series Circuits Linear Equations: Basic Theory Initial-Value and Boundary-Value Problems	13, 14, 15, 27, 29, 31 3, 4, 10, 12, 14
5	Oct 31 – Nov 04	4.1.2 4.1.3	Homogeneous Equations Non-homogeneous Equations	17, 22, 24, 29, 30 34, 36, 37(b and e)
First Exam, Tuesday November 03, 2009 [1.1-4.1.2] (22%)				
6	Nov 07 – 11	4.2 4.3	Reduction of Order Homogeneous Linear Equations with Constant Coefficients	2, 4, 8, 12, 14, 19, 20 6, 10, 14, 18, 20, 26, 34, 36, 40, 49, 50, 51
7	Nov 14 – 18	4.5 4.6	Undetermined Coefficients – Annihilator Approach Variation of Parameters	6, 8, 14, 24, 26, 32, 34, 40, 44, 48, 52, 60, 62, 68, 73 4, 6, 10, 12, 14, 18, 22, 24, 25, 28
EID Vacation: Thu. November 19 – Fri. December 04, 2009				
8	Dec 05 – 09	4.7	Cauchy-Euler Equation(*Both Methods*)	4, 6, 12, 14, 16, 18, 20, 24, 32, 34, 38, 39
9	Dec 12 – 16	6.1 6.1.1 6.1.2	Solutions About Ordinary Points Review of Power Series Power Series Solution	 1, 2, 4, 10, 12, 14 16, 17, 20, 22, 24, 28, 30, 32
10	Dec 19 – 23	6.2	Solutions about Singular Points	3, 4, 6, 10, 13, 14, 19, 20, 22
Second Exam, Tuesday December 22, 2009 [4.1.3 – 6.1] (22%)				
11	Dec 26 – 30	*App II*	Matrices and Linear Systems (*review*) The Eigenvalue Problem	14, 15, 19, 24, 27, 30, 32, 33, 39, 43 47, 49, 52, 53, 54, 55
12	Jan 02 – 06	8.1 8.2	Preliminary Theory Homogeneous Linear Systems	4, 6, 8, 10, 14, 15, 16, 18, 22, 24, 26
13	Jan 09 – 13	8.2.1 8.2.2 8.2.3	Distinct Real Eigenvalues Repeated Eigenvalues Complex Eigenvalues	4, 8, 10, 13, 14 20, 21, 24, 26, 27, 28 33, 34, 36, 39, 40, 42, 45
14	Jan 16 – 20	8.3 8.3.2 8.4	Nonhomogeneous Linear Systems Variation of Parameters Matrix Exponential	 11, 12, 14, 16, 23, 27, 30, 32 1, 4, 5, 6, 8, 9, 10, 12, 16
15	Jan 23 – 27	--	Pace Adjustment Review	

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

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The Syllabus (Cont'd): Remarks

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 362 is, of course, *omitted*.

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

Exams:

- The following dates for Major Exams I and II are set by the College of Sciences to avoid conflicts with other exams:
  - Exam I: Tuesday, November 03, 2009
  - Exam II: Tuesday, December 22, 2009
- The date, time and the place of the Final Exam will be announced by the Registrar.
- The Final Exam (36%) is Comprehensive.

Attendance:

- Attendance is compulsory. KFUPM policy with respect to attendance will be strictly enforced.

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