

**Department of Mathematics & Statistics, KFUPM**  
**SYLLABUS: MATH 202 (Elements of Differential Equations)**  
Semester II: 2009-2010 (092)  
**Course Coordinator: Dr. M. Samman**

Week	Date	Sec.	Topics	Selective Homework/Practice Problems
1	Feb 20-24	1.1 1.2	Definition and Terminology Initial-Value Problems	4, 7, 8, 9, 10, 13, 16, 20, 27, 28, 30,31 2, 12, 20, 22, 27,29
2	Feb 27- Mar 03	2.2 2.3	Separable Variables Linear Equations	8, 14, 20, 22, 23, 27, 47 5, 13, 16, 18, 30, 37
3	Mar 06-10	2.4 2.5	Exact Equations Solutions by Substitutions	2, 5, 8, 15, 25, 27, 29, 31, 42(a), 43, 44 4, 6, 10, 13, 18, 21, 26, 30 ,35
4	Mar 13-17	3.1 4.1 4.1.1	Linear Models: <i>Growth &amp; Decay, Newton's Law of Cooling and Series Circuits</i> Linear Equations: Basic Theory Initial-Value and Boundary-Value Problems	3, 5, 8, 9, 13, 14, 15, 17, 29, 31, 33  3, 4, 10, 12, 14
5	Mar 20-24	4.1.2 4.1.3	Homogeneous Equations Non-homogeneous Equations	17, 22, 24, 29, 30 34, 36, 37(b and e)
<b>First Exam: Sunday - March 28 [1.1-4.1.2] (22%)</b>				
6	Mar 27-31	4.2 4.3	Reduction of Order Homogeneous Linear Equations with Constant Coefficients	1, 3, 12, 14, 19 4, 9, 12, 15, 20, 34, 40, 49, 50, 51
7	Apr 03-07	4.5 4.6	Undetermined Coefficients – Annihilator Approach Variation of Parameters	8, 13, 22, 24, 34, 41, 48, 64, 67, 73  6, 11, 13, 24, 25, 28, 31
8	Apr10-14	4.7	Cauchy-Euler Equation( <i>Both Methods</i> )	3, 5, 10, 11, 14, 16, 19, 31, 34, 37, 39
<b>Midterm Vacation: Thursday April 15, 2010 – Fri. April 23, 2010</b>				
9	Apr 24-28	6.1 6.1.1 6.1.2	Solutions About Ordinary Points <i>Review of Power Series</i> <i>Power Series Solution</i>	 1, 2, 4, 10, 12, 14 16, 17, 20, 22, 24, 28, 30, 32
10	May 01-05	6.2	Solutions about Singular Points	3, 4, 6, 10, 13, 14, 19, 20, 22
<b>Second Exam: Sunday - May 02 [4.1.3 – 6.1] (22%)</b>				
11	May 08-12	<i>App II</i>	Matrices ( <i>review</i> ) Page APP-3 The Eigenvalue Problem Page APP-14	14, 15, 19, 24, 27, 30, 32, 33, 39, 43 47, 49, 52, 53, 54, 55
12	May 15-19	8.1 8.2 8.2.1	Preliminary Theory-Linear Systems Homogeneous Linear Systems Distinct Real Eigenvalues	4, 5, 8, 14, 15, 17, 23, 25  3, 7, 10, 13, 14
13	May 22-26	8.2.2 8.2.3	Repeated Eigenvalues Complex Eigenvalues	19, 21, 23, 25, 27 33, 34, 36, 39, 41, 45
14	May 29-Jun 02	8.3 8.3.2 8.4	Nonhomogeneous Linear Systems Variation of Parameters Matrix Exponential	 11, 12, 14, 16, 23, 27, 30, 32, 33 1, 4, 5, 6, 8, 9, 10, 12, 16
15	Jun 05 – 09	--	<i>Pace Adjustment</i> <i>Review</i>	

## Some Remarks & Policies

### Homework/Practice Problems:

- The selective homework/Practice Problems indicate the levels of the breadth and the depth of coverage. **Your course instructor will indicate the Homework every week. He may assign you Homework out of textbook as well.** To acquire proficiency on solution methods, the students are strongly urged to other problems from the relevant exercise.
- 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 of the textbook, *review material*, if any, is indicated. **The students must review the material carefully.** They 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** (88 points): **Sunday, March 28**, 2010
  - **Exam II** (88 points): **Sunday, May 02**, 2010
- The date, time and the place of the Final Exam will be announced by the Registrar.
- The Final Exam (144 points) is Comprehensive.
- 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 comensated:= 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

$$\text{ExM} = \text{AveM} + [11(\text{ExT}-\text{AveT})+18(\text{ExT}-\text{AveF})]/29$$

### Class Work (80 Points):

The policy on the class work will be determined by your course instructor and will be announced during 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.