

King Fahd University of Petroleum and Minerals  
Department of Mathematics & Statistics  
**SYLLABUS**  
Semester I: 2010-2011 (101)

**Course Coordinator: Dr. Boubaker Smii**

**Course #:** MATH 202  
**Title:** Elements of Differential Equations  
**Textbook:** A First Course in Differential Equations by D.G. Zill, 9<sup>th</sup> Edition

Week	Date	Sec.	Topics	Homework
1	Sep 25-29	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	Oct 2- 06	2.1 2.2 2.3	Solution Curves Separable Variables Linear Equations	1, 21, 24 8, 14, 20, 22, 23, 27, 45 5, 13, 16, 18, 30, 37
3	Oct 09-13	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 ,33
4	Oct 16-20	3.1 4.1 4.1.1	Linear Models: Growth and Decay, Newton's Law of Cooling and Series Circuits. 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	Oct 23-27	4.1.2 4.1.3	Homogeneous Equations Non-homogeneous Equations	15, 22, 28, 29, 30 33, 36, 37(b and e)
<b>First Exam: Tuesday - November 2<sup>nd</sup>, 2010 [1.1-4.1.2] (22%)</b>				
6	Oct 30-Nov 03	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	Nov 06-10	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
<b>EID Al-Adha Vacation: Thursday November 11, 2010 – Sun. November 21, 2010</b>				
8	Nov 22-24	4.7	Cauchy-Euler Equation( <i>Both Methods</i> )	3, 5, 10, 11, 14, 16, 19, 31, 34, 37, 39
9	Nov 27- Dec 01	6.1 6.1.1 6.1.2	Solutions About Ordinary Points Review of Power Series Power series solution	 1, 10, 11, 14 15, 17, 20, 22, 30, 32
10	Dec 04-08	6.2	Solutions about Singular Points	3, 6, 10, 13, 14, 19, 20, 27
<b>Second Exam: Tuesday, December 21, 2010 [4.1.3 – 6.1] (22%)</b>				
11	Dec 11-15	App II	Matrices and Linear Systems ( <i>review</i> ) App-3 The Eigenvalue Problem APP-14	14, 15, 19, 24, 27, 30, 32, 33, 39, 43 47, 49, 52, 53, 55
12	Dec 18-22	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
13	Dec 25-29	8.2.2 8.2.3	Repeated Eigenvalues Complex Eigenvalues	19, 21, 23, 25, 27 33, 34, 36, 39, 40, 41, 45
14	Jan 01-Jan 05	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	Jan 08 – 12 Jan 15-16	--	Pace Adjustment Review	

## Remarks & Policies

### Homework:

- The selective homework 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): **Tuesday, November 2nd**, 2010
  - Exam II (88 points):
- 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.

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