

King Fahd University of Petroleum and Minerals  
 Department of Mathematics & Statistics  
**SYLLABUS**  
 Semester II: 2010-2011 (102)

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

Week	Date	Sec.	Topics	Suggested Homework
1	Feb 12-16	1.1 1.2	Definition and Terminology Initial-Value Problems	Ex: 16, 22, 24, 30, 34, 38. Pgs 10-11 Ex: 14, 18, 20, 28, 30, 32. Pg 17
2	Feb 19- 23	2.2 2.3	Separable Variables Linear Equations	Ex: 8, 14, 20, 22, 24, 30, 48. Pgs 50-51 Ex: 6, 14, 16, 18, 30, 36. Pgs 60-61
3	Feb 26-Mar 2	2.4 2.5	Exact Equations Solutions by Substitutions	Ex: 8, 16, 24, 28, 34, 38. Pgs 68-69 Ex: 10, 12, 18, 20, 24, 36, 30. Pgs 74-75
4	Mar 5-9	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	Ex: 6, 8, 10, 12, 16, 18, 30, 32. Pgs 89-91 Ex: 4, 6, 8, 10, 12. Pgs 128-129
5	Mar 12-16	4.1.2 4.1.3	Homogeneous Equations Non-homogeneous Equations	Ex: 16, 18, 20, 26, 28. Pg 129 Ex: 32, 36, 38. Pgs 129-130
6	Mar 19-23	4.2 4.3	Reduction of Order Homogeneous Linear Equations with Constant Coefficients	Ex: 2, 4, 12, 16, 18. Pgs 132-133 Ex: 8, 20, 30, 34, 40. Pgs 138-139
<b>First Exam: Thursday - March 24<sup>th</sup>, 2011 [1.1-4.2] (22%)</b>				
7	Mar 25-30	4.5 4.6	Undetermined Coefficients – Annihilator Approach Variation of Parameters	Ex: 8,12,16,30,48,60,68.Pgs 156-157 Ex: 6, 12, 16, 20, 24, 26. Pgs 161-162
8	Apr 2-6	4.7	Cauchy-Euler Equation( <i>Both Methods</i> )	Ex: 8, 22, 28, 32 38. Pg 168
<b>Vacation: Thursday April 7<sup>th</sup>, 2011 to Friday April 15<sup>th</sup>, 2011</b>				
9	Apr 16-20	6.1	Solutions About Ordinary Points: 6.1.2 Power series solution	Ex: 16, 20, 24, 28, 30, 34. Pg 230
10	Apr 23-27	6.2	Solutions about Singular Points	Ex: 8,12, 14, 20, 24, 30, 32. Pgs 239-240
<b>Second Exam: Monday – April 25<sup>th</sup>, 2011 [4.3-6.1] (22%)</b>				
11	Apr 30-May 4	6.2 6.3	Continue with Section 6.2 Solutions about Singular Points Bessel's and Legendre's Equations (Some examples, No Properties)	Ex: 4,8,12,16,24, 44, 46. Pgs 250-253
12	May 7- 11	8.1 8.2 8.2.1	Preliminary Theory-Linear Systems (Appendix II for review) Homogeneous Linear Systems Distinct Real Eigenvalues	Ex: 6,8,12,4,16,20,24,26. Pg 311 Ex: 4,8,10,14. Pg 324
13	May 14-18	8.2.2 8.2.3	Repeated Eigenvalues Complex Eigenvalues	Ex: 20, 24, 28. Pg 325 Ex: 34,40, 44. Pgs 325-326
14	May 21-25	8.3 8.3.2	Non-Homogeneous Linear Systems Variation of Parameters	Ex: 6,8,10. Pg 332 Ex: 12,16,18,24,28 Pgs 333-334
15	May 28 – Jun 1	8.4 --	Matrix Exponential (No Laplace Transforms) Pace Adjustment and Review	Ex:2,4,6,8,10,16,20,24. Pgs 336-337

## Remarks & Policies

### Homework:

- Your course instructor will indicate the Homework every week. **He may assign you Homework out of textbook as well.**
- 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.
- **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): **Thursday, March 24<sup>th</sup>, 2011**
  - Exam II (88 points): **Monday, April 25<sup>th</sup>, 2011**
- 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 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.