

King Fahd University of Petroleum and Minerals
Department of Mathematical Sciences

SYLLABUS
Summer 2010 (093)
(Dr. Nasser-eddine Tatar)

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	(CAS)
1	July 03-07	1.1	Definition and Terminology	4, 7, 8, 9, 10, 13, 16, 20, 27, 28, 30	(55)
		1.2	Initial-Value Problems	2, 12, 20, 22, 27	--
		2.1	Solution Curves (<i>light coverage</i>)	1, 21, 24	(5,7)
		2.2	Separable Variables	8, 14, 20, 22, 23, 27, 45	(ex 4)
2	July 10-14	2.3	Linear Equations	5, 13, 16, 18, 30, 37	(5,9)
		2.4	Exact Equations	2, 5, 8, 15, 25, 27, 29, 31, 42(a), 43, 44	--
		2.5	Solutions by Substitutions	4, 6, 10, 13, 18, 21, 26, 30	--
		1.3	Mathematical Models (<i>reading</i>): Growth and Decay, Newton's Law of Cooling and Mixtures	See Sec. # 3.1	
		3.1	Linear Models	3, 6, 13, 14, 15, 19, 20, 21, 23	--
3	July 17-21	4.1	Linear Equations: Basic Theory		
		4.1.1	Initial-Value and Boundary-Value Problems	3, 10, 12, 13	--
		4.1.2	Homogeneous Equations	15, 21, 23, 28	--
		4.1.3	Nonhomogeneous Equations	33, 36, 37(b,e)	--
		4.2	Reduction of Order	1, 3, 12, 14, 19	--
4	July 24-28	4.3	Homogeneous Linear Equations with Constant Coefficients	4, 9, 12, 15, 20, 34, 40, 49, 50, 51	(57)
		4.5	Undetermined Coefficients – Annihilator Approach	8, 13, 22, 24, 34, 41, 48, 64, 67, 73	--
		4.6	Variation of Parameters	6, 11, 13, 24, 25, 28	--
		4.7	Cauchy-Euler Equation (<i>Both Methods</i>)	3, 5, 10, 11, 14, 16, 19, 31, 34, 37, 39	(44)
5	July 31- Aug 04	6.1	Solutions About Ordinary Points		
		6.1.1	Review of Power Series	1, 10, 11	--
		6.1.2	Power Series Solutions	15, 17, 20, 22, 32	--
		6.2	Solutions about Singular Points [©]	3, 10, 13, 14, 19, 20, 27	(ex 5)
6	August 07- 11	<i>App II</i>	Matrices and Linear Systems (<i>review</i>)	14, 15, 19, 23, 27, 29, 31, 33, 39, 43	--
			The Eigenvalue Problem	47, 49, 52, 53, 55	--
		8.1	Preliminary Theory	4, 5, 8, 14, 15, 17, 23, 25	--
		8.2	Homogeneous Linear Systems		
7	August 14-18	8.2.1	Distinct Real Eigenvalues	3, 7, 10, 13	(ex 2)
		8.2.2	Repeated Eigenvalues	19, 21, 23, 25, 27	--
		8.2.3	Complex Eigenvalues	33, 34, 36, 39, 41, 45	--
		8.3	Nonhomogeneous Linear Systems		
		8.3.2	Variation of Parameters	11, 12, 23, 32	(35)
		8.4	Matrix Exponential	1, 5, 9, 2, 6, 4, 8	(a,b) (27(a))
8	August 21-23	--	Pace Adjustment Review		

[©] Some statements about Bessel's equation and Legendre's equation should be included in the final remarks about Series Solutions. See the introductory paragraph of Section 6.3 in page 259.

Some Remarks & Policies

Homework/Practice Problems:

- The selective homework/Practice 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 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):
 - **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 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

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

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.