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

SYLLABUS

Semester II: 2011-2012 **(112)**

Coordinator: Dr. Nasser-eddine Tatar
Course #: MATH 202
Title: Elements of Differential Equations
Textbook: A First Course in Differential Equations by D.G. Zill, 9th Edition

Week	Date	Sec.	Topics	Suggested Homework Problems
1	Jan 28 – Feb. 01	1.1 1.2	Definition and Terminology Initial-Value Problems	4, 7, 8, 9, 10, 13, 16, 20, 22, 24, 30, 32, 34 2, 12, 20, 22, 24, 28, 30
2	Feb. 04 – 08	2.2 2.3	Separable Variables Linear Equations	8, 14, 20, 22, 24, 28, 30, 45 5, 13, 16, 18, 20, 24, 28, 30, 32
3	Feb. 11 – 15	2.4 2.5	Exact Equations Solutions by Substitutions	2, 5, 8, 15, 25, 28, 30, 33, 36, 42(a), 43 4, 6, 10, 13, 14, 18, 20, 22, 27, 28, 30
4	Feb. 18 – 22	3.1 4.1	Linear Models: Growth and Decay, Newton's Law of Cooling Linear Equations: Basic Theory	3, 5, 8, 9, 13, 14, 16, 18, 30, 32
5	Feb. 25 – 29	4.1.1 4.1.2	Initial-Value and Boundary-Value Problems Homogeneous Equations	3, 4, 5, 7, 10, 12, 14 15, 22, 24, 28, 29, 30
First Exam: Wednesday Feb. 29, 2012, 06:00 – 08:00 pm [1.1-4.1.1] (100 points = 25%)				
6	Mar. 03 – 07	4.1.3 4.2	Non-homogeneous Equations Reduction of Order	33, 34, 36, 37 (b,e) 1, 3, 8, 12, 14, 19, 20
7	Mar. 10 – 14	4.3 4.5	Homogeneous Linear Equations with Constant Coefficients Undetermined Coefficients – Annihilator Approach	4, 9, 12, 15, 18, 20, 26, 30, 34, 36, 40, 49, 50, 51 8, 13, 14, 22, 24, 26, 30, 32, 34, 41, 44, 48, 52, 60, 62, 68, 72
8	Mar. 17 – 21	4.6	Variation of Parameters	6, 11, 13, 18, 20, 24, 26, 28
Mid-Term Vacation: Sat. Mar. 24 – Wed. Mar. 28, 2012				
9	Mar. 31 – Apr. 04	4.7	Cauchy-Euler Equation (*Both Methods*)	3, 5, 10, 11, 14, 16, 18, 20, 24, 28, 32, 34, 38, 39
10	Apr. 07 – 11	6.1 6.1.1	Solutions About Ordinary Points Review of Power Series	 1, 6, 10, 11, 12, 14
Second Exam: To be announced [4.1.2 – 4.7] (100 points = 25%)				
11	Apr. 14 – 18	*6.1.2* 6.2	Power Series Solution Solutions about Singular Points	15, 17, 20, 22, 24, 28, 30, 32, 34 3, 6, 10, 13, 14, 18, 20, 22, 32
12	Apr. 21 – 25	*App II* 8.1	Matrices and Linear Systems (*review*) The Eigenvalue Problem Preliminary Theory	14, 15, 19, 24, 27, 30, 32, 33, 39, 43 47, 49, 52, 53, 54, 55, 59, 60, 61 4, 5, 8, 14, 15, 17, 18, 23, 24, 26
13	Apr. 28 – May 02	8.2 8.2.1 8.2.2	Homogeneous Linear Systems Distinct Real Eigenvalues Repeated Eigenvalues	 3, 7, 10, 13, 14 19, 21, 23, 25, 27, 28, 30
14	May 05 – 09	8.2.3 8.3	Complex Eigenvalues Nonhomogeneous Linear Systems	33, 34, 36, 39, 40, 41, 45
15	May 12 – 16	8.3.2 8.4	Variation of Parameters Matrix Exponential (No Laplace Transform)	11, 12, 14, 16, 23, 27, 30, 33 1, 4, 5, 6, 8, 9, 10, 16
Final Exam: To be announced [Comprehensive] (140 points = 35%)				

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

Remarks and Policies

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 335 is *omitted*.

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

Exams:

- 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

  ExM = AveM + [10(ExT-AveT)+14(ExT-AveF)]/24

- **Class Work (60 Points = 15%):** 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.

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