**King Fahd University of Petroleum and Minerals**
**Department of Mathematics and Statistics**
**SYLLABUS**
**Summer Term: 2012-2013 (123)**
Coordinator: Dr. Issam Louhichi,
Asst. Coordinators: Dr. Stephen Binns, Dr. Assane Lo

**Course #:** MATH 202
**Title:** Elements of Differential Equations
**Textbook:** A First Course in Differential Equations by D.G. Zill, 10th Edition

| Week | Date | Sec. | Topics | Suggested Homework Problems |
|---|---|---|---|---|
| 1 | Jun 08 – 13 (Thursday June 13th is a normal Sunday class) | 1.1 | Definition and Terminology | *4, 7, 8, 9, 10, 13, 16, 20, 22, 24, 30, 32, 34* |
| | | 1.2 | Initial-Value Problems | *2, 12, 20, 22, 24, 28, 30* |
| | | 2.2 | Separable Variables | *8, 14, 20, 22, 24, 28, 30, 45* |
| | | 2.3 | Linear Equations | *6, 12, 14, 18, 20, 24, 28, 30, 32* |
| 2 | June 15 –20 (Thursday June 20th is a normal Monday class) | 2.4 | Exact Equations | *2, 5, 8, 15, 25, 28, 30, 33, 36, 42(a), 43* |
| | | 2.5 | Solutions by Substitutions | *4, 6, 10, 13, 14, 18, 20, 22, 27, 28, 30* |
| | | 3.1 | Linear Models: Growth and Decay, Newton's Law of Cooling | *3,6, 8, 10, 14, 16, 18* |
| | | 4.1 | Preliminary Theory–Linear Equations | |
| | | 4.1.1 | Initial-Value and Boundary-Value Problems | *3, 4, 5, 7, 10, 12, 14* |
| 3 | June 22 –26 | 4.1.2 | Homogeneous Equations | *15, 22, 24, 28, 29, 30* |
| | | 4.1.3 | Nonhomogeneous Equations | *32, 34, 36* |
| | | 4.2 | Reduction of Order | *2, 4, 8, 12, 14, 19, 20* |
| | | 4.3 | Homogeneous Linear Equations with Constant Coefficients | *4, 9, 12, 15, 18, 20, 26, 30, 34, 36, 40, 49, 50, 51* |
| **Major Exam I:** Tuesday, **June 25**, 2013, **07:30PM – 09:30PM.** **Material:** 1.1 – 3.1 | | | | |
| 4 | June 29-July 3 | 4.5 | Undetermined Coefficients – Annihilator Approach | *8, 13, 14, 22, 24, 26, 30, 32, 34, 41, 44, 48, 52, 60, 62, 68, 72* |
| | | 4.6 | Variation of Parameters | *6, 11, 13, 18, 20, 24, 26, 28* |
| | | 4.7 | Cauchy-Euler Equation (*Both Methods*) | *4,8, 10, 11, 14, 16, 18, 20, 24, 28, 32, 34, 38, 39* |
| 5 | July 06 –10 | 6.1 | Review of Power Series | *1, 2, 4, 6, 10, 12, 14* |
| | | 6.2 | Solutions About Ordinary Points | *1, 3, 6, 8, 10, 14, 16, 18, 20* |
| | | 6.3 | Solutions About Singular Points | *3, 6, 10, 13, 14, 18, 20, 22, 32* |
| | | App II | Matrices and Linear Systems (*review*) | *14, 15, 19, 24, 27, 30, 32, 33, 39, 43* |
| **Major Exam II:** Sunday, **July 14**, 2013, **09:30PM – 11:30PM.** **Material:** 4.1 – 4.7 | | | | |
| 6 | July 13-17 | App II | The Eigenvalue Problem | *47, 49, 52, 53, 54, 55, 59, 60, 61* |
| | | 8.1 | Preliminary Theory – Linear Systems | *4, 5, 8, 14, 15, 17, 18, 23, 24, 26* |
| | | 8.2 | Homogeneous Linear Systems | |
| | | 8.2.1 | Distinct Real Eigenvalues | *4, 8, 10, 13, 14* |
| | | 8.2.2 | Repeated Eigenvalues | *20, 22, 24, 26, 27, 28, 30* |
| 7 | July 20-24 | 8.2.3 | Complex Eigenvalues | *33, 34, 36, 39, 40, 42, 45* |
| | | 8.3 | Nonhomogeneous Linear Systems | |
| | | 8.3.2 | Variation of Parameters | *11, 12, 14, 16, 23, 27, 30, 32* |
| | | 8.4 | Matrix Exponential (No Laplace Transform) | *1, 4, 5, 6, 8, 9, 10, 12* |
| 8 | July 27 | ---- | *Pace Adjustment and Review* | |
| **Final Exam:** Sunday July 28, 2013 09:00PM [Comprehensive] | | | | |

- 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.

- **Review Material:** In the introduction of each section in the textbook, *review material*, if any, is indicated. **Students** must do all reviews. Students should make a plan, based on the Syllabus, for all review materials 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 the Student:** Grade obtained = ExT, Ave of Exam: AveT

  **Final Exam:** Grade obtained = ExF, Ave of Exam: AveF

  **ExM = AveM + [10(ExT-AveT)+14(ExF-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 **8 unexcused absences** will be given a DN Grade for the course.