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

# Math 202 – Syllabus

**2014-2015 (141)**
**Coordinator: Dr. Husain Al-Attas**

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**Title**: Elements of Differential Equations.

**Credit**: 3-0-3

**Textbook**: A First Course in Differential Equations by D.G.Zill, 10th edition, 2013

**Description**: First-order and first -degree differential equations. Linear Models. Homogeneous differential equations with constant coefficients. Undetermined coefficients (Annihilator Approach), reduction of order, variation of parameters, and Cauchy-Euler equation. Series solutions. Systems of linear first-order differential equations.

**Grading Policy:**

| | | | |
|---|---|---|---|
| 1. **Exam I** | **Material:** 1.1-3.1 | **Place:** Building 54 | 25% (100 points) |
| | **Date**: Thursday, Oct. 16, 2014 | **Time:** 05:45pm | |
| 2. **Exam II** | **Material:** 4.1-4.7 | **Place:** Building 54 | 25% (100 points) |
| | **Date**: Thursday, Nov. 20, 2014 | **Time:** 05:45 pm | |
| 3. **Final Exam** | **Material:** Comprehensive | **Place:** Building 54 | 35% (140 points) |
| | **Date**: Tuesday, Dec. 30, 2014 | **Time:** 08:00 am | |
| 4. **Class Work** | **Class Activities:** They are based on quizzes, class tests, or other class activities determined by the instructor. Any quiz or test under class activities should be of a written type and not of a multiple choice type. The average x (out of 60) of class activities of the sections taught by the same instructor should be in the interval [36, 45]. | | 15% (60 points) |

**Exam Questions**:
The questions of the common exams are based on the examples, homework problems, and the exercises of the textbook.

**Missing Exam I or Exam II:**
No makeup exam will be given under any circumstance. When a student misses Exam I or Exam II for a legitimate reason (such as medical emergencies), his grade for this exam will be determined based on the existing formula which depends on his performance in the non-missing exam and in the final exam.

**Attendance:**
Attendance is a University Requirement. A DN grade will be awarded to any student who accumulates 9 unexcused absences.

**Academic Integrity:** KFUPM policy regarding ethics apply to this course.

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| Week | Dates | Sec. | Topics | Suggested Homework Problems |
|---|---|---|---|---|
| 1 | August 31- September 4 | 1.1 | Definitions and Terminology | 5, 13, 14, 18, 20, 22, 29, 32, 36, 38 |
| | | 1.2 | Initial Value Problems | 2, 6, 13, 19, 22, 24, 26, 30 |
| 2 | September 7-11 | 2.2 | Separable Variables | 6, 10, 12, 21, 26, 30, 32, 48 |
| | | 2.3 | Linear Equations | 4, 12, 15, 18, 20, 22, 28, 30, 36 |
| 3 | September 14-18 | 2.4 | Exact Equations | 5, 8, 12, 20, 28, 30, 31, 34, 42(b), 43 |
| | | 2.5 | Solutions by Substitutions | 2, 6, 8, 10, 12, 16, 22, 25, 28, 29 |
| | **Tuesday, September 23, 2014 National Day- Holiday** | | | |
| 4 | September 21-25 | 3.1 | Linear Models: Growth and Decay, Newton's Law of Cooling | 4, 8, 10, 15, 16, 18, 20 |
| | | 4.1 | Linear Equations: Basic Theory | |
| | **Eid Al-Adha Vacation September 26-Oct 11,2014** | | | |
| 5 | October 12-16 | 4.1.1 | Initial-Value and Boundary-Value Problems | 2, 4, 6, 10, 12, 13( c ), 14(d) |
| | | 4.1.2 | Homogeneous Equations | 16, 22, 24, 25, 28, 30 |
| | | **Exam I Thursday, Oct. 16, 2014: 5:45 pm; (25%) Building 54; Material: 1.1 till the end of 3.1** | | |
| 6 | October 19-23 | 4.1.3 | Nonhomogeneous Equations | 31, 34, 36 (b, c) |
| | | 4.2 | Reduction of Order | 4, 6, 10, 13, 16, 18, 19 |
| 7 | October 26-30 | 4.3 | Homogeneous Linear Equations with constant coefficients | 5, 8, 12, 14, 18, 22, 28, 32, 36, 42, 49, 50 |
| | | 4.5 | Undetermined Coefficients- Annihilator Approach | 2, 8, 14, 20, 25, 28, 32, 34, 44, 48, 50, 61, 64, 68, 71 |
| 8 | November 2-6 | 4.6 | Variation of Parameters | 2, 6, 11, 12, 18, 22, 24, 26, 28 |
| 9 | November 09-13 | 4.7 | Cauchy-Euler Equations( Both Methods) | 1, 6, 8, 12, 16, 18, 22, 24, 29, 32, 36, 38, 40 |
| 10 | November 16-20 | 6.1 | Review of Power Series | 2, 3, 4, 8, 10, 12, 16 |
| | | 6.2 | Solutions About Ordinary Points | 2, 4, 11, 12, 16, 21, 22 |
| | | **Exam II Thursday, November. 20, 2014; 5:45 pm; (25%) Building 54; Material: 4.1 till the end of 4.7** | | |
| 11 | November 23-27 | 6.3 | Solutions About Singular Points | 1, 4, 8, 12, 14, 16, 19, 24, 30, 32 |
| | | App II | Matrices and Linear Systems (review) | 12, 18, 22, 23, 26, 30(d,g), 36, 40, 44 |
| 12 | November 30- Decemeber 04 | App II | The Eigenvalue Problem | 48, 49, 53, 54, 56, 59, 60, 61 |
| | | 8.1 | Preliminary Theory-Linear Systems | 3, 6, 8, 10, 14, 15, 16, 19, 22, 24, 26 |
| 13 | December 07-11 | 8.2 | Homogeneous Linear Systems | |
| | | 8.2.1 | Distinct Real Eigenvalues | 2, 7, 9, 10, 14 |
| | | 8.2.2 | Repeated Eigenvalues | 22, 24, 26, 27, 29, 30 |
| 14 | December 14-18 | 8.2.3 | Complex Eigenvalues | 34, 37, 38, 42, 46 |
| | | 8.3 | Nonhomogeneous Linear Systems | |
| 15 | December 21-25 | 8.3.2 | Variation of Parameters | 12, 14, 15, 28, 30, 31 |
| | | 8.4 | Matrix Exponential ( No Laplace Transform) | 2, 5, 6, 8, 9, 10, 12 |
| | **December 28** | (Normal Tuesday classes) Pace Adjustment and/or Review | | |
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| | **Final Exam: Tuesday Dec. 30, 2014 08:00-11:00 am (Comprehensive 35%)** | | | |