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Check WebCt for any updates.

King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 322: Quantitative Methods for Actuaries (Term 142)

Policies relating to this course are governed by the College of Sciences.

General Information:

- **Instructor:** Mohameed El-Gebeily.
- **Office:** Building 5-325.
- **Extension #:** 3728.
- **Office Hours:** Sun Tue Thu from 11:00-12:00 am; also by appointment.
- **Email:** mgebeily@kfupm.edu.sa.

Textbooks:

1. *Numerical Mathematics and Computing* by Ward Cheney and David Kincaid, 7th Edition, Cengage Learning, 2012. (Required)
2. *Actuarial Mathematics* by Bowers et. Al, 1997. (Recommended)

The second book is also being used for AS381 and available at the library as a reference. We will only cover Chapters 1 through 3.

Software: We will be using Excel to perform computations and simulation.

Course Description: Algorithms; simplex and duality method; linear and quadratic programming; solution of non-linear equations; finite differences; cubic splines; individual risk models; life tables. Floating-point arithmetic and error analysis. Interpolation; Polynomial interpolation. Numerical integration and differentiation. Data fitting. Solution of linear algebraic systems. Initial and boundary value problems of ordinary differential equations.

Final Grade: Your final grade will depend on the following components with these proportions:

Homework	07%
Quizzes	08%
Exam 1	20%
Exam 2	20%
Exam 3	20%
Final Exam	25%

DN Grade: In accordance with university rules, 9 unexcused absences will automatically result in a grade of DN.

1. All major exams are in class.
2. You will be required to submit/upload Excel sheets for your work
3. Homework problems are to be done individually (do not collaborate with your classmates)

Weekly Coverage of Course Material

Week	Date	Section	Topic
1	Jan 25-29	1.2 1.3	Mathematical Preliminaries Floating-Point Representatiuon
2	Feb 1-5	1.4	Loss of significance Utility functions
Quiz # 1 (Thursday, Feb 6, 1.1-1.4)			
3	Feb 8-12	2.1 2.2	Naïve Gaussian Elimination Gaussian Elimination with Scaled Partial Pivoting
4	Feb 15-19	3.1 3.2	Bisection Method Newton's Method
First Major Exam (Thurday, Feb 20, 1.1-2.2)			
5	Feb 22-26	3.3 4.1	Secant Method Polynomial Interpolation
6	March 1-5	4.1 4.3	Polynomial Interpolation Estimate Derivatives
Quiz # 2 (Thrsday, March 6, 3.1-4.1)			
7	March 8-12	5.1 5.3	Trapezoid Method Simpon's Rules
Quiz # 3 (Tuesday, March 18, 4.3-5.3)			
8	March 15-19	6.1	First Degree and Second Degree Splines
March 22-26, Midterm vacation			
9	March 29-Apr 02	7.1 7.2	Taylor Series Method for IVP Euler's Method Runge- Kutta Methods
Scond Major Exam (Saturday, Apr 6, 3.1-7.1)			
10	Apr 05-09	8.1 8.4	Matrix Factorization Iterative Solution of Linear System
11	Apr 12-16	8.4 9.1	Iterative Solution of Linear System Method of Least Squares
Quiz # 4 (Thursday, Apr 24, 7.2-8.4)			
12	Apr 19-23	14.1 14.2	Standard Forms and Duality Simplex Method
13	Apr 26-30	14.2 14.3	Simplex Method Inconsistent Linear System
14	May 03-07		Individual Risk Method and Life Table
Third Major Exam (Thursday, May 8, 7.2-14.3)			
15	May 10-14		Individual Risk Method and Life Table