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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 131)

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

General Information:

- **Instructor:** Yaqoub Shehadeh.
- **Office:** Building 5-301.
- **Office Hours:** Sun Tue Thu from 08:00-09:50am.
- **Email:** shehadeh@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 Matlab 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:

Project/Lab	10%
Homework/Quizzes	15%
Exam 1	20%
Exam 2	20%
Final Exam	35%

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

Weekly Coverage of Course Material

Week	Date	Section	Topic
1	Sep1-Sep5	1.1 1.2	Introduction Mathematical Preliminaries
2	Sep 8-12	1.3	Floating-Point Repreentatiuon Big"O" Truncation Error
3	Sep 15-19	2.1 2.2	Naïve Gaussian Elimination Gaussian Elimination with Scaled Partial Pivoting
4	Sep 22-26	3.1 3.2	Bisection Method Newton's Method
5	Sep 29-Oct3	3.3 4.1	Secant Method Polynomial Interpolation
6	Oct 6-10	4.1 4.3	Polynomial Interpolation Estimate Derivatives
Id Al -Adha Vacation Oct 10-20			
7	Oct 21-24	5.1 5.3	Trapezoid Method Simpon's Rules
First Major Exam			
8	Oct 27-31	6.1	First Degree and Second Degree Splines
9	Nov 3-7	7.1 7.2	Taylor Series Method for IVP Euler's Method Runge- Kutta Methods
10	Nov 10-14	8.1 8.4	Matrix Factorization Iterative Solution of Linear System
11	Nov 17-21	8.4 9.1	Iterative Solution of Linear System Method of Least Squares
12	Nov 24-28	14.1 14.2	Standard Forms and Duality Simplex Method
Second Major Exam			
13	Dec1-Dec4	14.2 14.3	Simplex Method Inconsistent Linear System
14	Des 8-12		Individual Risk Method and Life Table
15	Des 15-19		Individual Risk Method and Life Table
16	Des 22-24		Individual Risk Method and Life Table