

KUWAIT UNIVERSITY
College of Engineering & Petroleum
CHEMICAL ENGINEERING DEPARTMENT

SUMMER SEMESTER 2012-'13

Numerical Methods for Engineers (ENG 308 -54)

<u>Prerequisites</u>	:	Computer Methods ENGR 200, Differential Equations: MATH 240
<u>Instructor</u>	:	Prof. M. R. Riazi Office: Bldg. 8 Kh., 5 th Floor, Room # 535, Chem. Eng. Dept. Phone: 24985772 (Dept. # 24817662) Email: riazi@kuc01.kuniv.edu.kw
<u>Office Hours</u>	:	Daily (11:40 - 12:30) Wednesday (9:20 – 10:20)
<u>Assistant</u>	:	Eng Ali Muqem (Tel: 249-85926) Office Hours: Sunday, Monday, Tuesday (8:00 – 9:00)
<u>Class Hours</u>	:	Daily (10:40 - 11:40)
<u>Place</u>	:	Bldg. 21 Kh., Room # 104

Course Objective:

The main objective of the course is to teach students the mathematical methods through numerical analysis once analytical methods cannot be used to solve engineering problems. In this course numerical methods to find roots of nonlinear equations, solution of system of equations, regression methods, interpolation of data, optimization methods, differentials and integration and differential equations will be taught. Use of computer tools especially Excel and Matlab will also be practiced throughout the course.

Main Text Book:

Steven C Chapra and Raymond P. Candle
"Numerical Methods for Engineers"
6th Edition, McGraw Hill, Int., New York, 2010. (www.phptr.com)

Grading: The course grade will be based (approximately) on the following considerations:

Attendance	-	8%
Homeworks	-	10%
Quizzes	-	12%
Midterm Exams (2 exams)	-	30%
Final Exam	-	40%

COURSE OUTLINE

CHAPTER	SUBJECT
1	Introduction and Engineering Mathematical Modeling
3	Approximate Solutions and Errors
4	Truncation Errors and Taylor Series
5	Bracketing Methods – Graphical, False Position , etc.
6	Open Methods (Iteration, Newton Raphson, Systems of Equations Section 6.5)
9	Gauss Elimination Method – Solving Number of Equations
11	Matrices and Gauss-Seidel Method
Part 5	Curve Fitting (p. 425)
17	Least Squares Regression
18	Interpolation of Data
21 & 22	Numerical Intgration
23	Numerical Differentiation
25	Ordinary Differential Equations – Numerical Methods
27	Bounday-Value and Eigenvalue Problems – Numerical Methods

Exam Dates:

Exam I: Tuesday June 11th

Exam II: Tuesday June 25th

Final Exam: July 14th: 9:00 – 11:00 am