CS 3723-Section 001
Numerical Methods for Engineering Syllabus
Spring 2008

Class Hours: TT 1:30PM – 2:20 PM
Classroom: SEC P203
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TA: Guillermo Michel
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Office Hours:
Tu 2:50 - 4:20 PM
Tu 11:45 AM– 1:15 PM
Th 2:50 - 4:20 PM
Th 11:45 AM– 1:15 PM

Texts:
ISBN #: 0073101567 (Copy on reserve, Engineering Library, Felgar Hall)

Recommended: ‘A Guide to Microsoft Excel for Scientists and Engineers’ by Bernard V. Liengme, 2002,
ISBN#: (0750656131) Edition (3), Note Chapters 8, 10, 11, 12


See ‘ecampus.com’ for books.

Course taught mostly from Microsoft Word class notes posted on D2L.

Prerequisites: MATH 3113, Introduction to Ordinary Differential Equations and an introductory programming course.

Course Objectives: Students will understand truncation error, round off error, and convergence and how they apply to numerical approximations of the solutions to equations. Students will be able to obtain numerical solutions to non-linear algebraic equations, systems of linear equations, definite integrals, non-linear ordinary differential equations, and curve fitting problems. Students will become proficient in formulating the numerical solution to a mathematical problem using Excel with Visual Basic for Applications (VBA).
Course Outline:
1. Programming (Excel, VBA) Taylor Series and Error Estimation
2. Numerical Differentiation and Round-off Error
3. Roots of Equations
4. Systems of Linear Algebraic Equations
5. Linear Regression and Polynomial Regression
6. Linearized Non-Linear Curve Fitting
7. Numerical Integration
8. First Order ODEs-Initial Value Problems
9. Second Order ODEs-Boundary Value Problems

Course Policies
Class Room:
Turn off and store cell phones, ipods, and all electronic apparatus before entering class. Bring to class and use laptop computers for Excel and VBA. Do not use laptops for games and unrelated surfing the internet during class. No earphones, earplugs, etc. to laptops allowed during class, only visual interaction with your laptops is allowed. No food or drinks allowed in classroom by university regulations.

Grading:
The final grade will be based on grades obtained on homework, major exams, and the final exam as follows:
1. Homework Average – 10% (two lowest grades dropped)
2. Average of Major Exams – 60% (lowest grade dropped)
3. Final Exam – 30%
Total  F: <60,  D: 60-69,  C: 70-79,  B: 80-89,  A: > 90

Major Exams:
All exams will be open book and open notes. Students will be given a paper exam with the exam problems. The problems will be solved on the laptop computer. The answers then entered back on the paper exams. You may also any other tools including graphing calculators, software written by the student, or commercial software. There will be 4 major exams plus a final exam. You may drop one major exam. The remanding three exams will be averaged to determine your final major exam grade to be multiplied by 60% to determine your final grade.

Mini-Exams:
Five Mini-exams will be given over each new concept. These 15-20 minute exams will be worked on the laptop computer. They will be open book, open notes, etc. Mini-exam grades will not be averaged into your final grade; however, students may substitute the highest one mini-exam scores for the score on any problem on any major exam except the final exam. For example, suppose that you made a score of 5/30 on problem 1 of Exam 1. Suppose that you had a Mini-Exam of 100. You could then replace your grade of 5/30 on problem with a score of 30/30 on Problem 1 and recalculate you new grade on Exam #1.
This does not happen until you have taken all four major exams and dropped your lowest of the four grades. You are responsible for keeping all of your major exams and Mini-Exams, because the original paper copy of the Major Exams and the Mini-Exams and Major must be turned together with a ‘Mini-Exam Credit Update Coversheet’ which on the last page of this syllabus. Staple filled out cover sheet over Mini-Exams & Exams. These cover sheets and the exams may be turned in any time between receiving your Exam#4 back and the beginning of the Final Exam.

**Homework Submission:**

Homework must be submitted electronically into the electronic drop-box in D2L. There will always be two files submitted for each homework submitted. The first file is Excel Spreadsheet showing computations with VBA programs. The second is a Word document with Spreadsheet plots and numerical tables copied and pasted into the Word document. Both files should be zipped together before they are submitted electronically. Highlight both files by holding down the ‘cntl’ key and left clicking on both files. Next right click on the highlighted cells. A dropdown menu will appear with ‘send to’. Left click on ‘sent to’ and a second dropdown menu will appear with ‘Compressed(Zip) Folder’. When you left click on this option a zipped file containing both the Excel Spreadsheet and the Word document is created. Submit this zipped file into the D2L drop-box. I will present material in class using Excel and Word 2003.

**Late Homework:**

Late homework will not be accepted. Homework is due the beginning of class on the day it is due. Students are responsible to submit their homework correctly and on-time. If you attempt to submit your homework using the Desire2Learn drop-box, but fail to do so correctly, so that your homework is not received on time, it will not be graded.

**Make-up Exams:**

No make-up exams will be given. Students who miss an exam will receive a grade of zero on the exam. There are no make-ups for mini-exams. Students should check the course calendar and plan to be present when exams are scheduled. Exceptions will be made only for Provost-approved university-sponsored activities such as athletic trips, scholarly competitions, and academic field trips.
Missed Exams and Homework: Students’ exam average and homework average will be based on dropping the lowest exam grade and the lowest two homework grades, respectively. If a student misses an exam he/she will receive a grade of zero on that exam. If a student fails to turn in a HW on time, he/she will receive a grade of zero on it.

Website: Homework assignments, and solutions will be posted on the course website, Desire2Learn. Students who miss class are responsible to get the homework assignment from the website and to submit the homework by the due date. Students are responsible to monitor the website for announcements regarding Homework, exams and mini-exams. Solutions to Homework, Major Exams and Mini-Exams will be posted on D2L.

Academic Misconduct: Students may work together on their homework assignments and may submit their homework jointly. To be certain that you receive credit for jointly submitted homework, you must clearly indicate that you worked together on an assignment. Students must work alone during all exams. Any student caught with any form of e-mail or text messaging open or otherwise cheating during an exam will receive an ‘F’ in the course and be recommended for dismissal from the University of Oklahoma.

Students with Disabilities: 1. Students requiring assistance in the event of an emergency evacuation must notify the instructor immediately.
2. Students requiring assistance to demonstrate their abilities on homework or exams should contact the instructor immediately so that any necessary accommodations can be arranged to facilitate full participation and equivalent educational opportunities.

Religious Holidays: Any student who plans to observe a religious holiday which may fall on a scheduled exam date or which conflicts with required class work must notify the instructor immediately. The four exam dates are listed on the course calendar.

See ‘Class Calendar’ on D2L website for daily class activity including all Homework due dates, Mini-Exam dates, Major Exam dates, and Final Exam date and time, and Holidays.
Name______________________

Mini-Exam(ME) Credit Update Coversheet, 3723 Section_____. Date __________

Exam # ______ Date_________ Original Grade________

1. Apply Mini-Exam # ____, ME Grade____

   to Problem#____ worth _______points x  ME Grade/100=________

Staple the Exam and the Mini-Exam used to update this Exam’s grade together under this cover sheet.

If you do not have the actual paper Min-Exam attached, multiply the ME Grade by .9 before entering the ME Grade in the space provided above.

Exam # ______ Date_________ Original  Grade  ______

Problem # ____ Original grade_______ Updated Grade_______, Improvement_______

Exam # ______ Date_________ Updated Exam Grade ______

Be sure to complete the entire sheet, including the second half lower part of this sheet.