CEE 384: Numerical Methods for Engineers

Fall 2012 Syllabus

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Course Time and Location: T TH, 3:00 – 4:15 PM, SS 105

Course Content and Objectives: This course introduces numerical methods and computational tools for engineers. Numerical methods are mathematical techniques used for solving engineering problems that cannot be solved or are difficult to solve using the traditional analytical techniques employed in previous math classes. The objectives of the course are to:

1) Introduce the fundamentals of numerical methods, with an emphasis on the most essential methods and their application.
2) Acquaint students with the terminology, approach, methods, and tools available to implement numerical algorithms.
3) Provide students an opportunity to enhance their programming skills using the Excel and MATLAB computing environments.
4) Teach the use of MATLAB and its built-in functions as a means of solving problems in engineering and checking the results of user-defined programs.

Class Policies:

1) Come to class on time and be prepared.
2) Retain originals or copies of all graded material until after the end of the semester.
3) Turn off cell phones, pagers, and any other devices that may disrupt the class.
4) Class discussion is encouraged, but always be respectful.

Missed Classes: Quizzes, in-class work, and exams may not be made up. Students may be granted the chance to make up graded work only if ALL of the following conditions are met:

1) Missed work will be rescheduled on a case-by-case basis
2) Students requesting to miss a class must identify themselves in writing at least one week prior to missing class.
3) Students participating in university sanctioned activities must provide a copy of their travel schedule indicating the ASU organization sponsor to letterhead of the sponsor.

Evaluation: Student evaluation in the course will be based on homework, quizzes, semester exams, and a final exam

(10%) Homework: Regular homework will be assigned about every second week. It will consist of a mixture of problems to work by hand, using Excel, and using MATLAB. Solutions to hand-worked problems should be well-organized and written neatly and legibly in pencil on green engineering grid paper. All work must be shown to receive full credit. Solutions to Excel and

MATLAB problems must include a descriptive algorithm. Although group discussion is encouraged, the final product shoud be your own individual work. If duplicate assignments (partial or entire) are submitted, all parties will receive a grade of zero. Additional action may be taken at the discretion of the instructor, as described in the Academic Honesty section. Homework assignments may not be graded in their entirety. Homework assignments will be generally checked for completeness and one or two randomly chosen problems will be graded thoroughly.

(15%) Quizzes: A number of unannounced quizzes will be given throughout the semester, and will feature material that has been covered between the previous and present quiz.

(45%) Exams: There will be three exams given throughout the semester. Each exam will account for 15% of the overall grade. The exams will be announced well in advance and may not be rescheduled.

(30%) Final Exam: The final exam will be comprehensive and will be given during the university-scheduled final exam period. It may not be rescheduled

Using the weighted average of these components, final grades will be assigned on the following basis:

A: 90-100 B: 80-90 C: 70-80 D: 60-70 E: <60

Grade Disputes: Assigned grades will not be discussed in class. If you would like to discuss the assigned grade, any disputes will be resolved personally, in the instructor's office within two weeks of receipt of graded materials.

Academic Honesty: The Fulton Schools of Engineering strongly believe in academic integrity; thus, cheating (in any form) is not tolerated. If a student is charged with academic dishonesty and found to be in violation, disciplinary action will be taken and a student's name will be kept on file. Disciplinary action may result in the student being suspended or expelled, given an XE on his or her transcript, and/or referred to Student Judicial Affairs. For additional information, please refer to the Student Academic Integrity policy and the ASU Student Code of Conduct.

Alternative Accommodations: Those who would benefit from alternative sites and/or dates for exams and who are registered with Disability Resources for Students should notify me during the first week of the semester. I will gladly work with you to accommodate your needs.

Materials: "Numerical Methods for Engineers" 6th edition by Chapra and Canale, published in 2009 by McGraw Hill.

Basic MATLAB programming will also be introduced in this class. Although there is no required MATLAB book, if you are unfamiliar with the program, there are many good references on the subject that you may opt to use, including:

- "Numerical Computing with MATLAB" by C.B. Moler, available from http://mathworks.com/moler
- "Essentials of Matlab Programming" by Chapman, published by Thomson Nelson in 2006
- "Matlab Demystified" by McMahon, published by McGraw Hill in 20007

- "Introduction to Programming Concepts with Matlab" by Kaw and Miller, published in 2010 and available from http://ww.lulu.com.

Calculator: Programmable calculators are not allowed in the course. The only acceptable calculator for use on exams is the TI-30Xa or the TI-30Xa solar. This calculator is on the approved list for the FE exam and is available at many outlets, including Office Depot, Staples, Target, Walmart, and Amazon.