

Fall 2009: MAE 2360 – Numerical Analysis and Programming

Instructor: Dr. Ram Laksnarain

MAE 2360, Fall 2009

Section 003 Tu/Th 8:30 – 9:20 AM, WH 210

Lab: Section 004 Wed 1:00 – 3:50 PM RH 211 A & B

Section 005 Tu/Th 5:30 – 6:20 PM, WH 311

Lab: Section 006 Wed 1:00 – 3:50 PM RH 311 A & B

Textbook: *None*.

Reference:

- *Applied Numerical Methods for Engineers and Scientists*, Prentice Hall, Singiresu S. Rao (ISBN - 013089480X)
- *Engineering Problem Solving with ANSI C* by Delores M. Etter, Prentice Hall
- *Engineering Programming C, MATLAB, JAVA* by Mark Austin and David Chancogne, John Wiley & Sons, Inc.

Instructor: Dr. Ram Laksnarain

Email: laks@uta.edu

Office (TBD)

Office Hours: Tu &Th: 11:00 AM - Noon.

Course Syllabus

MAE 2360 is an introductory course to programming languages and their applications in solving engineering problems. This course will provide students with opportunities to learn language constructs in 'C' / FORTRAN / MATLAB. It will also give the ability to understand computational techniques and algorithms used in solving problems of engineering interest. The students will be required to solve problems using the facilities provided in the labs.

Objectives: At the end of this course offering, the material covered will enable the students to solve engineering problems using computational techniques. The students will have a good understanding of the following topics to be covered during the semester.

1. A) Basics and advanced use of C language skills that can be used in generating numerical solutions to engineering problems.
B) Equivalent FORTRAN language for solving similar.
C) MATLAB use in solving some typical problems.
2. Numerical Method Topics:
Roots of linear and non-linear equations
Solution of simultaneous linear and non-linear algebraic equations
Matrix manipulations and applications to solving linear systems of equations
Numerical differentiation and integration techniques
Curve Fitting and linear regression
3. Set up models for solving engineering problems

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Course Outline:

Week	Topic	Sections
1	Introduction to Computing Systems, languages	
2-6	Introduction to 'C' and FORTRAN Problem Sets 1-6 Test 1 on week 5 (Key Assignment, passing grade required)	
7-13	Numerical Methods Problem Sets 7-11 Problem Set 12 (Key Assignment) Test 2 on week 9 Test 3 on week 13	
14-15	Review and Final Exam	

The topics mentioned above are tentative. There may be some adjustments to the schedule depending on the class progress during the semester.

Grade Evaluation:

Problem Sets:

40%

The problem sets can consist of a combination of theoretical problems to be solved and programming exercises. Students should anticipate spending about 4-5 hours per week in solving these problems. Effective utilization of the lab hours will help managing the time allocated for problems.

Tests and Exams:

All work to be shown on the exam paper. Students are required to write answers in answer book or engineering paper and stapled. Turning in work in loose papers is not allowed. Isolate the answer/s in boxes or as highlighted text. Discussions of any type will be considered as cheating and the student/s will be asked to leave the exam hall and will be assigned a grade of '0'. No makeup test for unsubstantiated absence during test period.

Tests (3) (10 + 15 + 15):

40%

The charts and tables will either be provided as required for the problem solving or the students will be allowed to have access to the tables in the book.

Final Exam:

20%

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- ‘A’ Grade requires a cumulative total of **90** and above.
- ‘B’ Grade requires a cumulative total between **80 and 89**.
- ‘C’ Grade requires a cumulative total between **65 and 79**.
- ‘D’ Grade requires a cumulative total between **54 and 64**.
- ‘F’ Grade will be assigned if the cumulative total is **below 54**.

Americans With Disabilities Act (Required by University as below):

The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 93112-The Rehabilitation Act of 1973 as amended. With the passage of new federal legislation entitled Americans with Disabilities Act (ADA), pursuant to section 504 of The Rehabilitation Act, here is renewed focus on providing this population with the same opportunities enjoyed by all citizens. As a faculty member, I am required by law to provide reasonable accommodation to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with informing faculty at the beginning of the semester and in providing authorized documentation through designated administrative channels. If you require an accommodation based on disability, I would like to meet with you in the privacy of my office during the first week of the semester to make sure that you are properly accommodated.

Academic Dishonesty (Required by University as below):

It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspensions or expulsion from the University. Scholastic dishonesty includes but is not limited to cheating, plagiarism collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts. (Regents Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22)