

CMPS 352 Scientific Computing

Fall 2003

Class Syllabus

General Information

- Instructor:

Name: Dr. Andrew C. Lee Email: cx19999@louisiana.edu
Office: Conf. Ctr. Rm 406 Phone: (337)-482-6638
Office Hour: See class webpage

- Teaching Assistants' Information:

Name: Mohsen M. Mohsen
Email: mmm5554@cacs.louisiana.edu

Their contact information, such as office hours etc. will be posted in our class webpage.

- Other Course Information:

- Class Web page:

<http://www.louisiana.edu/~mmm5554/352/home.html>

- Meeting time: MWF 12:00 pm - 12:50 pm;

- Meeting Location: MW HLG128. F WANT Lab.

- Texts:

1. Rudra Pratap, Getting Started with MATLAB, A Quick Introduction for Scientists and Engineers. Oxford University Press ISBN 0-19-515014-7.
2. Laurene V. Fausett, Applied Numerical Analysis Using MATLAB Prentice Hall ISBN 0-13-319849-9.

- Reference:

1. G. W. Stewart, Aftersnotes on Numerical Analysis, SIAM, 1996 ISBN: 0898713625
2. N. J. Higham and D. J. Higham, Matlab Guide, SIAM, 2000 ISBN: 0898714699

- MATLAB Website: <http://www.mathworks.com/>

Current Catalog Description ¹

This course will introduce the basic concepts of scientific computations. In particular, the ideas behind the basic computational methods and its implementations will be emphasized. MATLAB will be used as the major tool for solving these numerical problems. At the later part of this class, current topics such as parallel computing and visualization will be introduced briefly.

¹from UL Undergraduate bulletin 2003-2005

Course goals

Upon successful completion of this course, students will

- understand the fundamental computing techniques used in engineering, applied mathematics, physical and life sciences.
- gain the basic skills for using modern scientific computing softwares (e.g. MATLAB).

Major Topics

We will cover the following topics:

- An overview of computer-oriented methods for solving numerical problems in science and engineering
- Introduction to floating point computations
- Introduction to Vectors and Matrices
- Matrix Computations I: Solving Systems of Linear Equations
- Advanced methods on Matrix Computations
- Numerical Quadrature and Differentiation
- Fast Fourier Transform
- Selected Applications of Scientific Computations

These topics are inter-related. They may be introduced to you in a different order.

Coursework and Grading Criteria

- Labs (10 %): lab. attendance and completion of Lab materials.
- Midterms (40 %): two written midterms (20 % each)
- Quizzes (20 %): 4 to 5 quizzes.
- Final (30 %): No written final. Student are required to submit an individual term project. Presentation and/or Oral examination regarding the term project may be required.

Policies

1. Main documents: You are required to read the following documents:
 - Computer science departmental policies handout
 - Academic Honesty section in the UL at Lafayette Undergraduate Bulletin or UL at Lafayette Graduate Bulletin
2. Late Policies: Unless otherwise stated, late assignments will not be accepted. However, partial solutions that are turned in on time will be graded.
3. Incompletes: It will be assigned under very unusual/special circumstances.
4. Questions regarding any graded work MUST be submitted to the instructor IN WRITING within ONE WEEK of when the work was returned to the class.