

Set 0: Administrvia

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Department of Mathematics

Florida State University

Foundations of Computational Mathematics 1

Fall 2012

Course

- Time and Place : MWF 10:10 AM – 11:00 AM , 201 Love Building
- Instructor: K. A. Gallivan (5-0306, 318 Love Building, gallivan@math.fsu.edu)
- Office Hours: 8:00 AM – 9:00 AM and 11:00 AM – 12:00 PM, MWF and meetings by appointment
- Prerequisites: programming proficiency, linear algebra or consent of instructor
- Text: A. Quarteroni, R. Sacco, and F. Saleri, Numerical Mathematics, Springer Texts in Applied Mathematics 37, Second Edition.
- Grades: Programs 25%, Exam 1 20% , Exam 2 20% and comprehensive final 35

Information Distribution

The class webpage will be used to distribute all class information:

- follow Teaching link from <http://www.math.fsu.edu/~gallivan>)
- class announcements
- class notes
- programming and homework assignments and homework solutions
- exam information

Attendance

- University-mandated first class attendance
- Attendance for other lectures is not required but is strongly advised.
- A student absent from class bears the full responsibility for all subject matter and procedural information discussed in class.
- No makeup exams will be given without prior approval or, if not possible, without documentation of an excused absence.

Homework Assignments

- Homework will consist of written exercises assigned approximately weekly.
- Detailed solutions will be provided approximately one week after assignment.
- The written exercises are to assist you in understanding the material and preparing for the exams. They do not contribute to your grade and you are not required to turn in solutions.
- It is strongly recommended, however, that you do all assigned problems and consult the solutions and/or the instructor for the correct approaches to the problems.

Programming Assignments

- Programming assignments will be graded.
- Programming assignments are due at the time specified in the assignment.
- Programs will be accepted after the due date only with prior approval or with documentation of an excused absence.
- Assignments must be completed in a compiled and typed language such as Fortran, C, C++, Java. MATLAB and scripting languages are not allowed except for purposes related to displaying results.

Contents

1. Vector spaces, norms, inner products, and matrices
2. Factorization methods for solving linear systems and linear least squares problems
3. Conditioning and stability of numerical methods
4. Floating point arithmetic
5. Numerical stability of factorization methods
6. Basic iterative methods for solving linear systems
7. Solving scalar nonlinear equations
8. Systems of nonlinear equations
9. Unconstrained optimization