

ISC 4220
Algorithms for Science Applications 1
Fall 2012

SYLLABUS

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| Instructor | Sachin Shanbhag 488, Dirac Science Library sshahbhag@fsu.edu (*) |
| Class | DSL 152 (Lectures: MWF: 1010 – 1100) DSL 152 (Lab: R 1530 – 1800) |
| Office Hours | (i) set up time by email (deterministic), or (ii) stop by anytime to see if I am available (stochastic) |
| Text | Any one of the following three books is recommended but not required. (a) Numerical Methods for Engineers S. Chapra and R. Canale, 5th edition, McGraw Hill, 2005 (b) Numerical Methods: Design, Analysis, and Computer Implementation of Algorithms A. Greenbaum and T. Chartier, Princeton University Press, 2012 (c) Scientific Computing: An Introductory Survey M. Heath, 2nd edition, McGraw Hill, 2002 |
| Software | Matlab (or GNU Octave). They are available on classroom computers and department computers at the fourth floor of the Dirac Science Library. Students can buy the student versions at their own expense. |
| Grading | Assignments 60% (about 12, will disregard the lowest score) Quizzes 40% (4 quizzes, roughly once a month) Participation maximum bonus of 3% |
| Pre-reqs | Calculus 1 and 2 |

Description

“Basic computational algorithms including interpolation, approximation, integration, differentiation, and linear systems solution presented in the context of science problems. The lab component includes algorithm implementation for simple problems in the sciences and applying visualization software for interpretation of results. Prerequisite: MAS 2312. Corequisite: ISC 3222.”

Course Plan

Classes start on Aug 27 (M) and end on Dec 7 (F). Barring unforeseeable event, we will have 42 lectures and 14 labs. The days on which we will not have class are Sep 3 (Labor day), Nov 21 and 23 (Thanksgiving). A rough outline and sequence of topics is as follows:

1. Nonlinear equations (6)
2. Sources of Error (3)
3. Linear Systems (9)
4. Optimization (4)
5. Interpolation (3)
6. Approximation (3)
7. Numerical integration/differentiation (7)
8. Ordinary differential equations (7)

Note that this course plan may be subject to small changes.

Course Policies

- Assignments are due at the beginning of class on the due date. You will work individually. Most homeworks will involve using a computer. If you cannot submit an assignment on time, due to a legitimate reason, please inform me as soon as you can. Otherwise late submissions will be penalized *per day* by 10% for the first three days. I will not accept homeworks more than 3 days late. for attending and paying attention in class, and no special “preparation” is required.
- If you think you haven’t received the credit you deserve for a homework or an exam, write up your argument, and submit for re-grading no later than 3 days after the graded assignments have been handed out.
- In general, if you score more than 90% overall you will make an A, if you score less than 60% you will fail. I don’t pre-calibrate boundaries between other grades.

University Attendance Policy

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

Academic Honor Policy

The Florida State University Academic Honor Policy outlines the University’s expectations for the integrity of students’ academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to “. . . be honest and truthful and . . . [to] strive for personal and institutional integrity at Florida State University.” (Florida State University Academic Honor Policy, found at <http://dof.fsu.edu/honorpolicy.htm>.)

Americans With Disabilities Act

Students with disabilities needing academic accommodation should:

- register with and provide documentation to the Student Disability Resource Center; and
- bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class.

This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the:

Student Disability Resource Center
874 Traditions Way
108 Student Services Building
Florida State University
Tallahassee, FL 32306-4167
(850) 644-9566 (voice)
(850) 644-8504 (TDD)
sdradmin.fsu.edu
<http://www.disabilitycenter.fsu.edu>

Free Tutoring from FSU For tutoring and writing help in any course at Florida State University, visit the Academic Center for Excellence (ACE) Tutoring Services' comprehensive list of tutoring options - see <http://ace.fsu.edu/tutoring> or contact tutor@fsu.edu for more information. High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the highest level of individual academic success while upholding personal academic integrity.

Syllabus Change Policy

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.