Computational Methods for Continuous Problems/
Introduction to Numerical Differential Equations

ISC 4232/ISC5935

Fall 2013

Instructor:	Professor Janet Peterson **email:** peterson@scs.fsu.edu **Office:** 444 DSL **Phone:** 644-1979 **Office Hours:** W 2:15-3, F 12:30-1:15
Course Website:	http://people.sc.fsu.edu/∼peterson/
Class:	MWF 1:25-2:15 p.m.
Computer Lab:	W 8:30-11 a.m.
Lab TA:	Dave Witman **email:** dw11d@my.fsu.edu **Office:** 461A DSL
Text:	Notes from website

Course Description. This course provides the student with an introduction to the numerical solution of differential equations. We will begin this course with a review of initial value problems where we are given the initial state of the unknown and an expression for its rate of change; our job is then to find the unknown at subsequent times. The next part of the course will be concerned with solving boundary value problems where we know the value of the unknown or its derivative on the boundary of the domain and how some combination of its derivatives behave in the interior. These types of problems model states of equilibrium and do not involve time evolution. Finally we will combine our knowledge gained from solving initial and boundary value problems to solve an initial boundary value problem such as the heat/diffusion equation. We will be interested in seeing how various numerical methods are derived for these problems, studying their accuracy, stability, and convergence properties, efficiently implementing the methods in computer codes and expressing our results in a meaningful way.

Grading Policy. Your grade for the course will be determined by homework (including computer programs), class participation, computer laboratory assignments, a midterm and a final. The format of the class is not just the standard lecture format but rather you will be assigned readings and during class time there will be discussions and problem solving. Your participation in these discussions is paramount to understanding the material in this course. The distribution of grading for the course is as follows:

- Homework/computer assignments - 35%
- Midterm - 15%

- Final - 15%
- Class participation - 10%
- Computer Laboratory - 25%

Computer Laboratory. The computer laboratory provides you with a venue to explore numerical simulations in depth while solving more realistic problems. Writing and debugging a computer program can often be a time intensive task and the time in the computer laboratory can help to mitigate this because help is readily available from an experienced programmer who understands the algorithms. Consequently you are required to attend the computer labs and attendance will be monitored. When you turn in your assignment it should include (i) your write up in `pdf` format , (ii) your computer programs, and (iii) any additional files. You should `tar` these files and email to the TA by the due date. If for some reason you are unable to provide a `pdf` file for your write up, a hard copy must be put in the TA's mailbox by the due date. Typically the computer lab assignments will be due by 8:30 a.m. on Wednesday. This means that you will NOT be allowed to work on the old lab during Wednesday's 8:30-11 lab but rather you must concentrate on the new lab. However, some labs will be over a period of two or more weeks. Laboratory assignments turned in late are subject to the late homework policy below.

Late Homework/Laboratory Assignments. You are allowed to turn in one homework and one Computer Laboratory assignment up to one week late during the semester with no questions asked. Other assignments turned in late will have their value reduced by 5% daily up to one week late; after one week no late assignments will be accepted. Exceptions to these rules will only be made in the case of illness, etc. which can be properly documented as dictated by the University Attendance Policy below.

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 Universitys 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: (1) register with and provide documentation to the Student Disability Resource Center; and (2) 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)
sdrc@admin.fsu.edu
http://www.disabilitycenter.fsu.edu/