CS 6210: Advanced Scientific Computing I
Course Syllabus
Fall 2016

Instructor: Dr. Bei Wang Phillips
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Course Information

Meeting Time: Tuesdays, Thursdays, 12:25 p.m. - 1:45 p.m.
Classroom: WEB 1230
Textbook: ***A First Course in Numerical Methods*** **by Uri M. Ascher and Chen Greif**
Web page: `http://www.sci.utah.edu/~beiwang/teaching/cs6210-fall-2016.html`

Contact Information:

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Course Description

This course is a graduate breadth course to give students exposure to the algorithms and implementations often used in scientific computing. It is assumed that students have had some previous experience to numerical methods (such as in an introductory numerical analysis or scientific computing course) or in a numerical ODEs course; however, for the diligent student, very little previous knowledge is required (other than basic calculus, linear algebra and ODEs). This course will be followed by an advanced graduate course that focuses on the numerical solution of partial differential equations (CS 6220: Advanced Scientific Computing II).

Specifically, in this course, we will touch on the following topics:

- Nonlinear equations in one variable
- Computational linear algebra (direct and iterative methods)
- Eigenvalues and singular values
- Nonlinear systems and optimization
- Interpolation and approximation

- Numerical differentiation and integration.

Course Grading

Assignment 1: 5%
Assignment 2: 5%
Assignment 3: 13%
Assignment 4: 13%
Assignment 5: 17%
Assignment 6: 17%
Final Exam (Comprehensive): 30%

Scale for assigning letter grades is as follows. This scale might be curved based on overall class performance, while ensuring fairness to all.
A 100-93 **A-** 93-90
B+ 90-87 **B** 87-83 **B-** 83-80
C+ 80-77 **C** 77-73 **C-** 73-70
D+ 70-67 **D** 67-63 **D-** 63-60
E 60-0

Assignment Policies:

- All assignments will be take home and are to be done individually. Discussing topics is allowed; however, copying of each others work is considered cheating and will result in a failing grade. If a student is suspected of cheating, they may be asked to answer randomly selected homework questions in a public session to verify that they have actually mastered the material as claimed.

- There will be a call for assignments to be submitted. Assignments must be turned in at the beginning of class (i.e. at the time requested) on the day in which they are due.

  Most assignments should be submitted via Canvas as PDF files; if the assignment includes programming, source code should also be submitted via Canvas. Students are expected to submit completed assignments by the due date and time. To get full credit for an assignment, it must be turned in through Canvas by the start of class, specifically 12:25 p.m. Once the deadline is missed, those turned in late will lose 10% of its total points for each subsequent hour until it is turned in. Therefore, assignments will not be accepted more than 10 hours late, and will be given 0. For assignments involving programming, if the programs do not execute, no partial points will be given. Please take advantage of TA office hours. Please allocate sufficient time for completing the class assignments

- For assignments, typesetting (Latex, MS Word, ... even a typewriter if you can find one) is preferable. Assignments deemed unreadable will be rejected at the time of collection; they can be resubmitted, but with the late penalty applied per the previously mentioned policy.

Note Concerning CES Program: This class fulfills one of the requirements for the Computational Engineering and Science (CES) Program here at the University Enrollment in the program

is necessary to obtain CES Certificate or MS credit. If you are interested in learning more about the CES program, please visit www.ces.utah.edu or contact Vicki Jackson (vicki@cs.utah.edu, 801.581.8224).