CS 417/517 Computational Methods and Software
Spring 2004
Tues, Thurs 4:20 – 5:35 P.M. Education 226

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Office hours: Tues, Thurs 11:00 A.M. – 12:00 P.M.
and by appointment

CS 417/517 is an introductory survey of scientific computing, intended for advanced undergraduates majoring in computer science, any of the engineering or scientific disciplines, or mathematics and statistics. Core topics will include the common topics that scientists and engineers use to solve the computational problems that arise frequently in their work. Among these are: computer arithmetic, systems of linear equations, data fitting with least squares, eigenvalue problems, numerical differentiation and integration, and differential equations. Computer science students will find this material essential when they work in inter-disciplinary teams solving a problem in science or engineering.

The emphasis of the course is on the computational algorithms and high quality library software available for solving problems; the mathematical background necessary to understand these will be discussed. CS 687, High Performance Scientific Computing, is a follow-on course at the graduate level, treating some of the topics in this course in additional detail.

Students will learn to solve computational problems on departmental computers or on their PCs, using the Matlab programming environment. Matlab is an industry standard mathematical modeling software tool because of the functionality and the ease of programming it provides. Homework will include extensive “paper and pencil” exercises and programming problems involving Matlab.

Pre-requisite for this course include either Math 316U (Linear Algebra) or Math 307U (Differential Equations), and CS 250, and these will be enforced. The mathematical concepts will be quickly reviewed, but programming and operating systems will not be.

Grading: Class room participation will be included in assigning you a grade, hence attendance is mandatory. Problem sets and assignments will count for 40% of the grade; midterm and final exams will account for the other 60%.

I will post all assignments and class handouts (and any corrections to the same) in the course directory: 
www.cs.odu.edu/~pothen/Courses/CS417.

CS 517

Graduate students taking CS 517 can expect three differences: higher quality work will be expected of them; they can expect additional work including a project; and a different grading scale will be used. For instance, they will be expected to read an advanced treatment of the course material and solve problems from the book, Numerical Linear Algebra, Trefethen and Bau, SIAM.

Academic Integrity

I expect all students to abide by the ODU honor code. All work that you submit for grading should be your own. It is NOT appropriate for you to solve a problem together with some one else, write up a common solution, and then submit separate answers. I encourage discussion of class room material among yourselves for shared learning, but not assigned home work problems. You should also cite any sources that you use in your work. If you have questions whether a collaboration or discussion would be inappropriate, please ask me for clarification.