CS623: Parallel Iterative Computing
Spring 2007 (MWF: 2:00pm – 2:50pm) C226-OHR

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Office Hours: WF: 1:00pm – 2:00pm, and by appointment.

Objectives: Introduce advanced computational science techniques and tools that support large scale engineering and scientific computations. Emphasis on robust and parallel iterative methods for solving large sparse linear systems.

Prerequisites: Two 500 level CS courses (and preferably CS621). Some background on computer architectures and scientific computing. Programming proficiency in Fortran (preferred) or C, and parallel programming in MPI.

Special Feature: Programming assignments on a parallel supercomputer. Reading assignments of research papers.


Topical outline (tentative):

- discretization of partial differential equations
- basic iterative methods
- fast and parallel multigrid methods
- Krylov subspace methods and parallel implementations
- parallel preconditioning techniques
- Domain decomposition techniques (time permits)

HOMEWORK: Homeworks assigned in sheets will be collected within 1 week in class. Late submissions will not be accepted. Homework assignments are to be worked out independently.

CHEATING: Students have to do the work by themselves. They can help each other with general concepts; however, direct assistance with a particular solution will be considered as cheating. Please refer to Student Rights and Responsibilities for more details concerning cheating; let me only remind that the minimum penalty for cheating is an E-grade.

Grading: Homeworks and programming projects (40%); one midterm exams (temporarily set on March 17, Monday) (30% each); final exam (4/28 at 1:00PM 30%). In case of legitimate reasons (see Student Rights and Responsibilities), students must inform the instructor in advance to schedule an exam that will take place before the exam for the whole class. Make-up exams after that will only be given in cases of unforeseen (legitimate) reasons.

Letter Grade: A: 100  B+: 86  B: 85  C+: 76  C: 75  D: 60, E: 59  F: 0.