Administrativia

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Office: 6150 Sennott Square  
Office hours: Mon 3:30-4:30pm, Wed 2:00-3:00pm

Schedule: the class meets on Thursdays, 6:00pm - 8:30pm, room 5129 at Sennott Square.
Webpage: http://coco.sam.pitt.edu/~emeneses/teaching/cs1645

Goal

High Performance Computing (HPC) has been identified as one key area to sustain technological innovation and foster high-impact scientific discoveries. This course offers an introduction to the fundamentals of HPC. The topics include a survey of the main architectural components of a supercomputer, the major parallel programming paradigms, and relevant parallel algorithms in computational science. The contents of the course provide a balance of theoretical and practical aspects in parallel computing. A student of this course is expected to develop the right skills to design parallel applications and to effectively use modern HPC platforms.

Textbook

The official textbook for the course is:

Two other useful sources are the following:

Prerequisites

This course has the following prerequisites:
• CS 449: Introduction to Systems Software.
• CS 1501: Algorithm Implementation.
The machine problems assume the student is familiar with the C programming language.
Topics

- High performance computing systems
- Parallel programming patterns
- Multiprocessor architectures
- Cache coherence in symmetric multiprocessors
- Shared-memory programming with OpenMP
- Accelerators programming with OpenMP extensions
- Interconnection networks
- Models of parallel processing
- Performance metrics
- Distributed-memory programming with MPI
- Parallel algorithms
- Advanced parallel programming models

Grading

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<td>Homeworks and Project</td>
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<td>Midterm Examination</td>
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<td>Final Examination</td>
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Policy on Cheating

The highest academic integrity standard is expected from every student in this course. The solutions to all the assignments and examinations in this course should be the result of the student’s individual effort. Presenting the words or ideas of somebody else under your name hinders your skills in problem solving and violates the university’s policy on academic integrity (http://www.provost.pitt.edu/info/ai1.html). Cheating on an exam or plagiarizing a homework will result in a score of “0” for all the students involved. Multiple violations to this policy will result in a final grade “F” in the course.

Students with Disability

Contact the Office of Disability Resources and Services, 216 William Pitt Union (412-648-7890), as soon as possible in the term. They will determine a reasonable accommodation for this course.