Course Description:

Parallel machines are here to stay. This is underscored by the fact that all system manufacturers offer multiprocessors at the top of their product line. Recent advances in high bandwidth, low latency networks are enabling practical parallel computing on clusters of workstations.

This course is designed to provide seniors and graduate students in computer science and engineering with understanding of fundamentals of parallel and distributed systems. Specific topics discussed include: symmetric multiprocessors, message passing machines, distributed shared memory machines, as well as programming environments on such machines. How to program parallel machines will also be covered in the class. Upon completion of this course, students are expected to become familiar with the fundamentals of parallel and distributed computing and obtain skills for making efficient use of the parallel and distributed systems.

Tentative Syllabus

Overview of Parallel/Distributed Computing; Models of Parallel Computers; Parallel Software Basics; Multithreaded Programming in Pthread; Message Passing Interface (MPI) Programming; Parallel/Distributed Java Programming

Course Prerequisites:

It is assumed that you have background of computer organization (equivalent to ECE4680/CSC4100) and programming skills in C/C++. If you feel that your background is lacking in some of these areas, please review the material of relevant courses and come to see Professor Xu.

Course Textbook

The material presented in the course will be complemented by the following reference books, programming manuals and tutorials. Most of them are available on-line.


- Ian Foster, Designing and Building Parallel Programs, (Available at http://www.mcs.anl.gov/dbpp).
The course material, including Lecture Notes, Problem Sets and Reading Papers, will be available on the site “http://www.ece.eng.wayne.edu/~czxu/ece561.html”.

Each student needs an account on workstations in Computer Laboratory of COE for multi-threading and MPI programming. Every student is encouraged to create his own home page.

Required Work and Grading Policy

- Programming Labs: The course will be fast-moving, so it is important to keep up with the work. Biweekly programming labs will provide an opportunity to let the material presented in the class “sink in”. Because each lab has an extended assignment period, you are expected to make use of that flexibility to deal with any personal time constraints. No late work will be accepted and no make-up for examinations.

- Final grades will be calculated based on the following weights: Programming Labs and Homework Assignments — 50%, Two Midterm Exams — 40%, and Project — 10%.

- The final grade will be distributed as A (100–95), A- (94–90), B+ (89–85), B (84–80), B- (79–75), C+ (74–70), C (69–65), C- (64–60), F (60 or below).

Deferred Grades

A grade of “I” will only be assigned if a student IS NOT currently failing the course and if there is NOT a substantial amount of work to be completed. An “I” grade MUST be made up within one year of assignment of the grade. Assignment of an "I" grade will be at the sole discretion of the instructor.

Professional Integrity

Cheating, unfortunately, it is necessary to mention it here. Since institutions of higher education must provide society with engineers who subscribe to the highest principles of integrity, instructor encourages integrity and works to insure the learning environment is intolerant of cheating. Cooperation is not the same as cheating. It’s OK to ask someone about the concepts before you start to do homework or project assignments; however, copying and altering other people’s code or solution sets is strictly prohibited.

Space does not permit listing all forms of cheating. In general, the instructor defines cheating as any activity that gives a student an unfair test advantage or credit where it is not appropriate. The instructor welcomes comments, in person or otherwise, which will insure that grading is conducted in a just manner. Students who are caught cheating face possible expulsion from the University and will receive a grade “F”. Any work submitted for a grade must include the following statement and be signed and dated. If this is missing or not signed and dated, the work will be returned ungraded.

I have neither given nor received unauthorized assistance on this work.

Signed: Date: