CS 4075 Concurrent and Distributed Programming

Syllabus

Fall 2018

Lectures: M/W 12:15 - 1:30 pm, ET A210

Instructor: Yuqing Zhu
yuqing.zhu@calstatela.edu
(323) 343-4572
ET A327

Office Hours: T: 9:30 - 11:30 am, 1:30-2:30PM
Th: 1:30-2:30PM

Course Description: Foundations and practical knowledge about parallel computing. The students will be familiar with the hardware and software information for current parallel systems, and have introductory experiences with parallel programming.

Course Goals: At the end of the course, students are able to
1. Know the basic parallel hardware and the parallel software design methodology.
2. Implement efficient parallel programs for some sample problems.
3. Be very familiar with using MPI, Pthreads, and OpenMP - three of the most widely used APIs for parallel programming to write parallel programs.

(Chapters 1 - 5 will be covered, Chapters 6 may be covered if time allowed.)

Reference(s):
2. The Art of Multiprocessor Programming. By: Maurice and Nir.
Topics:  
1 von Neuman architecure, parallel hardware including SIMD and MIMD systems etc., parallel software including Caveats, shared-memory, distributed memory, etc., parallel program design with Foster's methodology.
2 Distributed-memory programming with MPI. The Trapezoidal rule in MPI, performance evalulation of MPI programs, parallel sorting example using MPI.
3 Shared-memory programming with Pthreads. Producer-consumer synchronization, barries and condition variables, read-write locks.
4 Shared-memory programming with OpenMP. The reduction clause, scheduling loops.
5 Parallel program design samples.

Grading Policy: Midterm Exam (20%), Final Exam (30%), Homework (40%), and Attendance (10%).

A  Score 90 - 100  
B  Score 80 - 89  
C  Score 70 - 79  
D  Score 60 - 69  
F  Score 0 - 59

Academic Honesty: Students are allowed and encouraged to discuss reading materials with each other. However, homework assignments must be solved and written individually. If you obtain a solution with help then you should acknowledge your source in the paper and then write independently your own solution. Cheating will not be tolerated. Cheating on any assignment or exam will be taken seriously. All parties involved will receive a grade of F for the course and be reported to the Academic Senate.

ADA  
If a student has a disability that qualifies under the American with Disabilities Act (ADAAA) and requires accommodations, he/she should contact the Office for Students with Disabilities for information on appropriate policies and procedures.

General Policies:  
1 Makeup Exams: No.
2 Homework Assignments: Non-programming homework
**Final Exam:**

Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation.

**NO MAKE-UP EXAMS, NO LATE HOMEWORKS, AND NO INCOMPLETES!!!**

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** Homework Assignments:**

- **Non-programming homework assignments** should be written or typed neatly on standard sized paper (8.5 x 11 inch), possibly in black or blue ink (please do not use red) and submitted at the due date (no electronic submissions accepted unless stated otherwise in class). Each page should be numbered. Late submissions will not be accepted.

**Programming homework assignments and projects must be presented to the instructor.**

The student who presents the work will get 20% extra credit.

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**Final Exam:** To be announced.