UNIVERSITY OF CALIFORNIA
UCMERCED

Syllabus for CSE179-01: Intro Parallel Computing

Spring 2019
Instructor: Dong Li

Designation:	Introduction to Parallel Computing
Catalog Description:	Parallel computing is pervasive. From embedded devices, laptops, to high-end supercomputer, and large-scale data centers, parallel computing is widely employed to achieve performance and efficiency targets. This course introduces the foundations of parallel computing, including parallel architectures, parallel programming methods and techniques, and parallel algorithm designs.
Text Books and Other Required Materials:	Ananth Grama, Anshul Gupta, George Karypis, and Vipin Kumar. Introduction to parallel computing, second edition, Addison-Wesley, 2003, ISBN: 0201648652
Course Objectives/ Student Learning Outcomes:	This course will cover five major themes: 1. Parallel programming: Students are expected to learn parallel programming models, including MPI, OpenMP and Pthreads. 2. Parallel computing platforms: Students are expected to learn common parallel computing architectures, including shared memory coherence and synchronization, GPU architecture and control structure and memory hierarchy. 3. Parallel algorithms: Students are expected to learn common parallel algorithms, including parallel matrix multiplication, parallel graph algorithm, parallel search, parallel dynamic programming, and parallel sorting.
Program Learning Outcomes:	
Prerequisites by Topic:	CSE 140 CSE 100 CSE 031 MATH 024
Course Policies:	Attendance is required; Homework is posted at CatCourses; Weekly Lab; No cheating policy.
Academic Dishonesty Statement:	a. Each student in this course is expected to abide by the University of California, Merced's Academic Honesty Policy. Any work submitted by a student in this course for academic credit will be the student's own work. b. You are encouraged to study together and to discuss information and concepts covered in lecture and the sections with other students. You can give "consulting" help to or receive "consulting" help from such students. However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in the form of an e mail, an e mail attachment file, a diskette, or a hard copy. Should copying occur, both the student who copied work from another student and the student who gave material to be copied will both automatically receive a zero for the assignment. Penalty for violation of this Policy can also be extended to include failure of the course and University disciplinary action.

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	c. During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examinations will result in failure of the exam, and may lead to failure of the course and University disciplinary action.
Disability Statement:	Accommodations for Students with Disabilities: The University of California Merced is committed to ensuring equal academic opportunities and inclusion for students with disabilities based on the principles of independent living, accessible universal design and diversity. I am available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances. Students are encouraged to register with Disability Services Center to verify their eligibility for appropriate accommodations.
Topics:	1.Parallel programming * Principles of parallel algorithm design * Programming shared-memory platforms with OpenMP * Programming shared-memory platforms with Pthreads * Collective communication * Message passing and MPI 2.Parallel computing platforms * Shared memory coherence and synchronization * Control structure and memory hierarchy * Network topology * GPU and CUDA programming 3.Parallel Algorithms * Dense matrix multiplication * Parallel graph algorithms * Parallel search algorithms * Parallel dynamic programming * Parallel sorting algorithms * Warehouse-scale computers
Class/laboratory Schedule:	Lecture: T/TR 4:30-5:45PM, GRAN 135; Lab: T 1:30-4:20PM, CLSSRM 281, F 10:30AM-1:20PM, SSM 154
Midterm/Final Exam Schedule:	This schedule is subject to change, but is tentatively set as follows: Midterm: March 21, 2019 Final: May 11, 2019 11:30AM-2:30PM GRAN135
Course Calendar:	
Professional Component:	
Assessment/Grading Policy:	Attendance: 5% Mid-term: 10% Homework: 15% Labs: 33% Final exam: 37%
Coordinator:	Dong Li
Contact Information:	Office: SE2 211 Email: dli35@ucmerced.edu
Office Hours:	Thursday 3:15 pm – 4:15 pm