

CSCI 503: Parallel Programming

Spring 2013

Course Information

Lectures: Monday 2:00 - 4:50 PM, KAP 140

Class webpage: <http://hpc.isi.edu/csci503/>

Instructor: Bob Lucas

Email: rflucas@isi.edu

Office hours: Monday 1:00 - 2:00 PM or by appointment

TA: John Tran

Email: jtran@isi.edu

Office hours: Friday 8:30 - 9:30 AM or by appointment

Course Description: Exploration of parallel programming paradigms, parallel computing architectures, hands-on parallel programming assignments, contemporary and historical examples and their impact, context with parallel algorithms.

Prerequisites: CSCI102 and CSCI445. Students should be able to program in C/C++. The majority of the programming assignments are designed for the Unix environment; and as such; students should have basic Unix skills. Note that this is not a required prerequisite but will greatly help with the homework assignments.

Textbook(s):

Levesque, John and Gene Wagenbreth. *High Performance Computing: Programming and Applications* (recommended).

In addition to the textbook, students will be given additional reading materials. These include papers, lecture notes, and tutorials. Students are responsible for all assigned reading assignments.

Course Policy

Grading Policy. Although there are no exams for this course, it is homework intensive. Students are expected to **independently** (unless noted otherwise) complete homework assignments and a **collaborative course project**. Failure to complete the course project will seriously jeopardize the final grade.

Final Grade Scale. Please note that the grading scale is fix and that completion of the course project is required for a passing grading. For example, although a student has earned a perfect 70% for the

homework and 5% for course participation, he/she is not guaranteed a **B-** for the course if his/her final project is not completed. In fact he/she has volunteered for an **F** final grade.

> 95	A
90 – 94	A-
85 – 89	B+
80 – 84	B
75 – 79	B-
70 – 74	C+
65 – 69	C
< 65	F

The final grade will be a cumulative percentage of the grades earned for the homework assignments, class participation, and final project:

Homework	70%
Final project	25%
Class participation	5%

Homework Assignments. All homework assignments are to be submitted to BlackBoard. When in doubt, students should verify their assignments on aludra.usc.edu (when applicable) to ensure that TA/grader can compile and execute their code. To obtain maximum points on the homework assignment, please follow the assignment guideline and grading rubric carefully. Finally, please consult the **UHS GG** document for our philosophy on homework grading.

Final Project. The course final project is a collaborative effort for teams...

Class Participation. Regarding the class participation grade, there are three components. To earn the full 5% course participation grade, we consider the following:

- (1) Students will need to be active in the discussion forums. For example: asking questions and posting answers to other students' questions.
- (2) **Students will need to respond to at least 3 papers posted for discussion.** Their responses should reflect, obviously, that they have read the papers and put serious thoughts on the subject matter. Note that in order to prevent everyone from responding to the same paper, only first 10 responses per paper count. **Early bird gets the worm.**
- (3) Although not required but highly recommended, students should make efforts to ensure that the instructor know who they are, i.e. participate in class, utilize office hours, and be engaging when working on the course project.

Late Submission. Late assignments are assessed 33% for each day late. In extenuating circumstances, e.g. serious medical ailment or a dismemberment of various body parts, etc, students **must communicate**

and make arrangement with the instructors and/or the TA in advance. Finally, an original doctor's note must accompany the late submission.

Homework Re-Grade. Any request for re-grade must be submitted in writing, with carefully worked out explanation of why it's believed that an assignment has not been properly graded.

Academic Integrity. Cheating will not be tolerated. **All parties involved will receive a grade of F for the course and be reported to SJACS.** If you have questions or concerns regarding what is permitted and not permitted in terms of collaboration or teamwork, please do not hesitate to confer with the instructor/TA for clarifications.

Course Schedule

Date			Topic	Assignment Due
Jan 14	L1	Bob	Introduction to Parallel Computing	
Jan 21			MLK's Birthday (University Holiday)	
Jan 28	L2	Bob	Parallel Algorithms	
Feb 4	L3	Jacque	Shared Memory 1	HW 1 (Theory)
Feb 11	L4	Jacque	Shared Memory 2	
Feb 18			Presidents' Day (University Holiday)	
Feb 25	L5	Bob	Message Passing 1	HW 2 (Threads)
Mar 4	L6	Bob	Message Passing 2	
Mar 11	L7	Gene	Streaming and Data Parallel (CUDA)	HW 3 (MPI)
Mar 18			Spring Break	
Mar 25	L8	Craig	Map Reduce (Hadoop)	Project Proposal
Apr 1	L9	Sergio	Quantum Computing	HW 4 (CUDA)
Apr 8	L10	Gene	Debugging and Performance	
Apr 15	L11	Bob	Heterogeneous Systems and Future of Parallel	HW 5 (MR, QC)
Apr 22	L12	Bob	Applications of Parallel Computing	
Apr 29			Project presentation	Project Report