Core Course Information

GOALS AND OBJECTIVES:

Course Description: Overview of parallel computing; processors, communications topologies and languages. Use of workstation networks as parallel computers. Design of parallel programs: data composition, load balancing, communications and synchronization. Distributed memory and shared memory programming modules; MPI, and OpenMP; fast parallel I/O. Performance models and practical performance analysis. Case studies of parallel applications in Scientific Computing and Data Science. Use will be made of the parallel machines in the Center for High Performance Computing https://www.chpc.utah.edu/

Course Outcomes On completing this module students should be able to: understand parallel computer architecture; write portable parallel programs using the message passing system MPI and the shared memory directives OpenMP, construct performance models for parallel programs in Scientific Computing and also for some simple Data Science applications and run them on HPC resources.

Credits This is a 3 credit graduate class with three assignments and two exams.

EXPECTATIONS FOR STUDENTS IN COURSE:

Class attendance is required and I expect you to arrive on time for class. I expect you to read all of the assigned materials and to be prepared to discuss material in class. Your grade in this course will be determined by your performance on two exams and three/four assignments.

EXAMS SCHEDULE:

Mid-term Monday October 2nd 2017 Final Monday December 11th 2017

REQUIRED/RECOMMENDED COURSE MATERIALS:

Course Texts: the course will be based on parts of the following online texts

Parallel Programming in MPI and OpenMP by Victor Eijkhout

An Introduction to High Performance Computing by Victor Eijkhout
https://www.tacc.utexas.edu/~eijkhout/Articles/EijkhoutIntroToHPC.pdf