CSC 6220: Parallel Computing I: Programming
ECE 5610: Introduction to Parallel and Distributed Systems
(Syllabus)
Fall 2011

Description: This course introduces various aspects of parallel programming and applications. Specific topics include:
- Parallel programming models.
- Principles of parallel algorithm design.
- Basic communication operations.
- Analytical modeling of parallel programs.
- Programming using the message passing paradigm (MPI).
- Programming shared memory systems (POSIX Threads and OpenMP).

Learning Objectives: At the end of this course, students will be able to:
- Understand the basics of parallel and distributed systems.
- Develop programs for message-passing systems using MPI.
- Develop programs for shared memory systems using threads and OpenMP.
- Analyze the performance of parallel programs.

Prerequisites: CSC 2200, 2201, 4100 / ECE 4050, 4680 or consent of instructor

Location: 318 State Hall

Time: Monday and Wednesday 6:00-7:20 pm

Instructor: Daniel Grosu
Office: 5057 Woodward, Suite 14001.4
http://www.cs.wayne.edu/~dgrosu
Email: dgrosu@cs.wayne.edu
Phone: (313) 577-5171
Office hours: Monday and Wednesday 4:50 pm - 5:50 pm or by appointment

Textbook: A. Grama, A. Gupta, G. Karypis and V. Kumar.

References: You may find the following books and manuals useful for programming assignments:
- “Multithreaded Programming with Pthreads” by B. Lewis and D. J. Berg,
- “Parallel Programming with MPI” by P. Pacheco, Morgan Kaufmann, 1996.
Grading:  
Final Exam 30%  
Term Project 40%  
Homework and Programming Assignments: 30%  
Overall: 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(below 60).

Lecture Attendance and Make-up Exam Policy: Attendance in the lecture is not mandatory, but is strongly recommended. No make-up exams will be given except for university sanctioned excused absences. If you miss an exam (for a good reason), it is your responsibility to contact me before the exam, or soon after the exam as possible. Leave a message at the above number or send me email.

Outcome Coverage:

(a) An ability to apply math, science and engineering knowledge. The homework and exams require direct application of mathematical, scientific, and engineering knowledge to successfully complete the course. This requires applying basic algorithm analysis methods, using network performance models, analytical determination of communication times.

(b) An ability to design and develop programs for different types of parallel systems. Students design several programs using MPI on a network of workstation and WSU grid. Students also use POSIX threads and OpenMP to develop programs for shared memory systems.

(c) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context. Students taking the course will realize the broad applicability of parallel algorithms to electrical engineering, mechanical engineering, manufacturing, bioinformatics, aeronautics, business, etc. The project involves solving problems from these areas by using parallel and distributed systems.

Scholastic Dishonesty: The University expects a student to maintain a high standard of individual honor in his/her scholastic work. Unless otherwise required, each student is expected to complete his or her assignment individually and independently. Although study together is encouraged, the work handed in for grading by each student is expected to be his or her own. Any form of academic dishonesty will be strictly forbidden and will be punished to the maximum extent.

Late Policy: Homeworks and projects must be handed in by due time. No late assignments will be accepted unless compelling reasons can be supplied and verified. Late assignments will receive no grade.

Students with Disabilities: If you have a documented disability that requires accommodations, you will need to register with Student Disability Services (SDS) for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TDD only). Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Student Disability Services mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity
to fully participate in their educational experience at Wayne State University. Please be aware
that a delay in getting SDS accommodation letters for the current semester may hinder the
availability or facilitation of those accommodations in a timely manner. Therefore, it is in your
best interest to get your accommodation letters as early in the semester as possible.

The instructor reserves the right to alter this syllabus as necessary.