CS 4234 Parallel Computation
Fall 2018 Syllabus

Instructor: Dr. Kirk W. Cameron
cameron@vt.edu

Meeting Time: MW 2:30 p.m – 3:45 p.m. Place: MCB 655

Office Hours: Immediately following class, 3:45-4:30pm M/W in classroom.

TA: Payel Bandyopadhyay
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Office Hours: Tuesdays and Thursdays 9am-10am (MCB 124a – CS UG Learning Center)
Occasionally for projects/exams: Tuesdays and Thursdays 6-7pm (MCB 124a)

Required Text: Pacheco, An Introduction to Parallel Programming, Morgan Kaufmann, 2011.

Prerequisites: CS 3214 (Computing Systems) with a C or better

Grading:

10% Homework (3 @ 3.33% each)
45% Projects (3 @ 10% each, 1 @ 15% each)
45% Exams (3 @ 15% each)
Up to 3 points extra credit added to exam average for participation/attendance.

Exams:

No makeup exams will be given without documented excuse. Exams will be closed book. A crib sheet will be allowed during the exam and will be discussed later in the course.

Homework problems:

Homework problems are designed to illustrate concepts, facilitate discussion, draw attention to deficiencies, and prepare students for examination. Homeworks will be graded as fully attempted (100%), partially attempted (50%), or not attempted (0%). All problems fully attempted (right or wrong) will receive full credit. Solutions to selected exercises will be discussed in class prior to the exams. Students should attend the TA office hours to review any homework problems for which they have any difficulties.

Supplementary readings:

A reading list may be provided on the web site and updated periodically. Students are responsible for material in all readings assigned even if not covered in lecture.

Class Projects:

There will be four projects totaling a significant portion of student grades (45%). The purpose of these projects is to illustrate practical application of concepts and techniques discussed in the course. All projects will be discussed in detail later in the course.

Academic Responsibility:

Rules and regulations are clear. Your work must be your own. Cheating in any form will not be tolerated. Questionable behavior should be brought to the attention of the instructor immediately. Students found guilty of academic dishonesty will receive an F in the course and be recommended for academic discipline at the department and university levels. YOU are responsible for reading information regarding your academic responsibility. It is your responsibility to seek clarification from the instructor PRIOR to engaging in activities of a questionable academic nature.

Justification and learning objectives:

Parallel computation is pervasive in all levels of computing---from massively parallel supercomputers used in large scale computational science, to multi-core, multi-processor systems from mobile devices to servers used in support of massive data processing for search, social media, data analyses, gaming, sensor networks, etc. The major issues raised in each of the core areas of computer science (e.g., algorithms, systems, languages, architecture, etc.) become more interesting and challenging when considered in the context of parallel computing. Hence, this course pushes students to apply in a new context the concepts and tools they have studied in earlier computer science courses. This is a programming heavy, hands-on course that will introduce students to a topic of fundamental importance nearly every area of computer science.

Having successfully completed this course, the student will be able to:

- explain the basic concepts of parallel computation and become familiar with state-of-the-art parallel architectures.
- compare alternative approaches to designing and implementing parallel algorithms and architectures.
- solve large scale problems and implement system software to support parallel computing on the most common parallel computing platforms.
- measure and evaluate the performance of parallel applications.