Contact Information
- Instructor: Dr. Gregory Wolffe  (wolffe@gvsu.edu)
- Office:  2228 Mackinac (331-3884)
- Hours:  Monday, Wednesday 2:00 - 3:30, and whenever.
- Info Page:  http://www.csis.gvsu.edu/~wolffe/courses/cs380
  Includes all course policies, announcements, assignments and class documents.

Course Description and Objectives
To obtain strong theoretical and analytical foundations as required for understanding and developing parallel algorithms. To obtain a working knowledge of the programming techniques, tools and platforms used in modern high-performance computing. Topics covered include:
- Foundation: mathematical and analytical techniques
- Analysis: modeling; algorithm analysis and design; parallel methods
- Implementation: scientific and commercial applications
- Infrastructure: parallel tools, languages, environments and platforms

Suggested Prerequisites
- CS 263/362  Data Structures and Algorithms
- CS 251/351  Computer Organization
- CS 261/361  C and Unix

Textbooks
Required:

Grading Grading Scale
- 25%  Homework  A  90%
- 25%  Quizzes  B  80%
- 25%  Programming assignments  C  70%
- 25%  Group projects  D  60%
-  F  <60%

Course Policies
- Homework and programming projects are due at the beginning of class on the due date. NO late assignments will be accepted unless prior arrangements have been made.
- Assignments, unless otherwise specified by the instructor, are to be completed individually. Students are encouraged to consult each other for instructional assistance only.
- Exams may only be rescheduled with prior approval of the instructor.
- The deadline to drop with a “W” is Friday, February 27th, at 5:00 p.m.
Course Outline

1. Introduction / Background

2. Mathematical Foundations
   - Asymptotic analysis
   - Induction/Recursion
   - Recurrence equations
   - Performance evaluation

3. Parallel Algorithm Analysis and Design
   - Task-channel
   - Partitioning (decomposition)
   - Reduction
   - Pipelining
   - Divide-and-conquer

3. Applications of Parallel Algorithms
   - Combinational circuits
   - Matrix operations
   - Computational geometry
   - Graph algorithms
   - Image processing
   - Numerical algorithms
   - Sorting/searching/optimization
   - Data mining

4. Infrastructure and Support
   - Multiprocessors
   - Clusters
   - Multi-threaded programming
   - OpenMP
   - PVM/MPI
   - Tools/utilities

Final Exam: Wednesday, 4/21 (6:00 - 7:50 p.m.)