

Syllabus

CSCI 322, Principles of Concurrent Programming, Winter, 2013

- **Instructor:** Geoffrey Matthews, x3797, geoffrey dot matthews at wwu dot edu
- **Office hours:** MTWR 3:00
- **Texts and Readings:**
 - *The Little Book of Semaphores*, Allen B. Downey, <http://www.greenteapress.com/semaphores/>
 - *Distributed Programming*, Gregory Andrews, Addison-Wesley, 2000.
 - *Foundations of Multithreaded, Parallel, and*
 - Various CUDA tutorials to be listed later.
- **Webpage:** Moodle access key: noodle
- **Lectures:** MWRF 2:00-2:50pm, AW 203
- **Content:** This course will cover key concepts, both abstract and concrete, in concurrent programming. Topics covered include:
 - Algorithms for mutual exclusion.
 - Synchronization and communication techniques
 - * Semaphores
 - * Monitors
 - * Rendezvous
 - * Condition variables
 - Multi-process and multi-threaded programming
 - Concurrent programming facilities in high-level languages
- **Course goals:** On completion of this course, students will demonstrate:
 1. Thorough understanding of problems and techniques in concurrent programming.
 2. Thorough understanding of algorithms, techniques and programming language support for mutual exclusion, synchronization and communication between processes and threads.
 3. Thorough understanding of the purpose, implementation and use of semaphores, monitors, and rendezvous in concurrent programming.
 4. The effective use of programming language facilities and libraries in the design and implementation
 5. The effective use of programming language facilities and libraries in the design and implementation of multi-threaded and multi-process applications.
- **Software:** I will be illustrating concurrent programs with Scheme, Python, and Ada. Students unfamiliar with any of these languages may want to brush up.
- **Exams:** All exams will be open book and open notes. One midterm and one final.
- **Quizzes:** Except for the first and last weeks of class and exam days, we will have weekly quizzes on Fridays.
- **Reading:** All students are expected to do the online reading assigned throughout the quarter in order to be prepared for the weekly quizzes and the exams.
- **Homework:** Homework assignments will be passed out regularly through the quarter, involving a mix of theory (math) and programming. Homework will be due at the start of class on the due date. Late work is accepted at a penalty of 25% per each fraction of 24 hours late.
- **Grading:**

$$0 \leq F < 60 \leq D < 70 \leq C < 80 \leq B < 90 \leq A$$

Homework	Quizzes	Midterm	Final
40%	20%	15%	25%

- **Academic dishonesty:** Academic dishonesty policy and procedure is discussed in the University Catalog, Appendix D. All students should read this section of the catalog. It consists of misrepresentation by deception or other fraudulent means. In computer science courses this frequently takes the form of copying another's program, either a fellow student's program, or copying one from the web. Due diligence should be exercised in the labs at all times, since both copying and letting someone else copy your program are equally culpable. Do not walk away from your computer in the lab without logging out or locking the screen. Do not share files, even if it is just to "show them something." Describe it in words, or talk to them in person, never share code.
- **Collaboration:** Collaboration with your fellow students is a good way to learn. Feel free to share ideas, solve problems, and discuss your programs with other students. However, collaboration is *not* copying. All code should be original. Remember **the Simpson's Rule:** after discussing homework with another student, each of you must destroy all written notes, pictures, files, *etc.* that you shared. After that, you must watch a rerun of *the Simpson's*, or do something else unrelated, for half an hour. Then you can take the knowledge you gained from another student and put it to work, since it is now not copying, but learning. You have made it your own.
- **Approximate Schedule:** The following schedule may be adjusted radically depending on interests and problems as they occur.

Little Book of Semaphores	2 weeks
Foundations Part I	3 weeks
Midterm Friday February 8	
Foundations Part I	1 week
Foundations Part II	1 week
Foundations Part III & CUDA	2 weeks
Review	1 week
Final Tuesday March 19 1:00	