Spring 2009

CEG 434/634-01: Concurrent Software Design

Thomas C. Hartrum
Wright State University - Main Campus, thomas.hartrum@wright.edu

CEG 434/634
Concurrent Software Design

Syllabus

Spring Quarter, 2009

Time/Place: Lecture: 4:10 – 5:25 PM, Tu./Th., Biological Sciences 105

Instructor: Dr. Thomas C. Hartrum, 337 Russ Engineering Center
Tel. 937-775-5015, Email: Thomas.Hartrum@wright.edu
Office Hours: MTWR 2:00-4:00 or by appointment.

GTA: None.

Prerequisite: CS400, CEG433/633, Operating Systems.
Expected background: discrete mathematics, data structure, C or C++ programming experience in UNIX.

Course Description: This course provides an introduction to concurrent program design in the UNIX environment. Classical problems of synchronization, concurrency, and their solutions are examined through course projects and through readings on operating system design.

Text Books: *Required*: Operating System Concepts, 6th, 7th or 8th Ed., Silberschatz and Galvin, Addison-Wesley, 2002.
Required: Unix Systems Programming: Communication, Concurrency and Threads, Robbins and Robbins, Prentice Hall, 2003.
References: Interprocess Communications in Linux: The Nooks and Crannies, John S. Gray, Prentice Hall, 2003.

Website: **www.cs.wright.edu/~thartrum**

Grading: Programming assignment – 30 %
Homework – 10%
Midterm Exam – 30%
Final – 30%

Lectures:

The following tentative schedule defines in greater details what material is covered in the course and when it is covered.

Week	Reading	Contents
1	Robbins Ch. 1 Silberschatz Ch. 1	Welcome and introduction
2	Silberschatz Ch. 3, 5 Robbins Ch. 2	Review: Process management, process scheduling, CPU Scheduling
3	Robbins Ch. 6, 8	Basic UNIX inter-process communication Asynchronous events – UNIX signals
4	Robbins Ch. 18,20 Gray Ch. 10	Client server computing Inter-process communication with socket
5	Gray Ch. 10	Network Programming Using socket Midterm Exam (Thursday)
6	Silberschatz Ch. 4 Robbins Ch. 12	Threads and POSIX threads
7	Silberschatz Ch. 6 Robbins Ch.13,14	Process synchronization (critical sections, semaphores, etc.)
8	Silberschatz Ch. 6 Robbins Ch.13,14	Case Study: Classic Synchronization Problems
9	Siberschatz Ch.7 Robbins Ch. 14	Deadlocks
10	Siberschatz Ch.9	* Selected Topics: Advanced Virtual Memory Management, middleware and network programming
11	Tuesday, June 9, 2009 5:45 P.M. – 7:45 P.M.	Final exam