**Computer Science 5204**
**Operating Systems**
**Fall, 2008**

**Instructor**: Dr. Dennis Kafura
**Phone**: 540.231.5568 (office and phone mail)
**E-mail**: kafura@cs.vt.edu
**Office Hours**: By arrangement

**Class Web Page**: http://courses.cs.vt.edu/~cs5204/kafura-fall08/

**Prerequisites**:

This is an introductory graduate level course. It is assumed that each student has taken an undergraduate course in operating systems (equivalent to CS 3204) or has equivalent knowledge of the basic subject matter of operating systems through course work or practical experience. Prerequisite knowledge in operating systems is operationally defined by the following materials:

Operating Systems (H.M. Deitel) Chapters 1-10
Operating Systems Concepts (J. Peterson, a. Silberschatz) Chapters 1-10.
Operating Systems Concepts ( A. Silberschatz, P. Galvin) Chapters 1-9.
Operating Systems (W. Stallings) Chapter 1-8.
Modern Operating Systems (A. Tanenbaum) Chapters 1-6.

Knowledge is also assumed of basic concepts in data structures, programming languages, and computer architecture.

**Readings:** This is a reading intensive class with approximately three required papers assigned per week. All readings are available as PDF files on the class web calendar.

**Textbook**: There is no required textbook. The web pages list several reference books.

**Grading**:

| | | |
|---|---|---|
| First Exam | 150 points | Take home, during the week of October 14 |
| Final Exam | 150 points | Take home, December 12-15. |
| Problem Sets | 200 points | As assigned |

**Recorded Lectures:** All lectures for the class will be recorded and made available through the class web site in streaming video format. The recorded lectures will typically be available a few days after the class meeting.

**Honor Code:** All work is conducted under the rules of the university Graduate Honor Code. This code and other relevant policies are described in detail on the class web pages.

**Syllabus**

| Section | Topics | Date |
|---|---|---|
| **Interaction** | Course Introduction<br>Threads, Scheduler Activations | August 26 |
| | Threads vs. Events | September 2 |
| | Concurrency Control in CSP<br>Concurrency control is C# | September 9 |
| | Concurrency theory ($\pi$-Calculus) | September 16 |
| | Transactional Memory | September 23 |
| | Distributed Transactions | September 30 |
| **Security** | Access Control Models<br>Cryptography, Digital Signatures | October 7 |
| | Midterm (take home) | week of Oct. 14 |
| | Authentication<br>Authorization (XACML) | October 21 |
| | Authorization (SecPAL)<br>Kerberos | October 28 |
| **Fault Tolerance** | Time, Event, and Message Ordering<br>Checkpointing | November4 |
| | Global State Recording<br>Commit algorithms | November 11 |
| **Virtualization File Systems** | Virtualization | November 18 |
| | Thanksgiving Break | November 25 |
| | Google File System<br>Peer-to-peer file systems | December 2 |
| | File Systems | December 9 |
| | Final Exam (take home) | Dec. 12-15 |