Course Number: 3460:428  
Course Name: Unix Systems Programming  
Course Credits: 3 credits  
Schedule: Intermittent  

Syllabus Date: October 12, 2007  
Prepared By: Dr. Darrell Ulm  
Modified By: Dr. Michael L. Collard  

Prerequisites: 3460:316, Data Structures & Algorithms II  

Text:  
Shelley Powers, Jerry Peek, Tim O’Reilly, and Mike Loukides, UNIX Power Tools, O’Reilly; Third Edition ISBN 0596003307  

Bulletin Description:  
Overview of the UNIX operating system. Shell programming, process management, memory management, I/O, network communication, and systems programming in C with low-level kernel calls.  

Detailed Description:  
The successful student will be able to program the Bash shells, effectively utilize a Unix system, write utilities in C using low-level kernel calls, understand process creation, dynamic memory allocation, signals, low-level I/O, pipes, and sockets. The student will complete projects using UNIX utilities and the C API of UNIX.  

Course Goals:  
Effectively utilize a unix system. Write and employ shell scripts and filters. Program well-written UNIX utility programs in C.  

Topics:  
1. Why UNIX?  
2. UNIX tools and configurations  
   a. Customization of environment  
   b. Working with files and directories  
   c. Basic editing  
   d. Processes and the kernel  
   e. Scripting  
   f. Extending and managing environment  
   g. Communications and Connectivity  
3. Introduction to UNIX architecture  
4. Basics of C programming  
5. The Kernel C interface  
6. UNIX C Programming  
   a. Asynchronous events  
   b. Concurrency  
   c. Communications
**Computer Usage:**
Typically 6-7 programming assignments involving shell script programming and UNIX kernel programming in C.

**References:**
Graham Glass, King Ables, UNIX for Programmers and Users, Prentice Hall; 3rd edition (February 6, 2003)

Arnold Robbins, Unix in a Nutshell, O'Reilly & Associates; 3rd edition (November 15, 1999)