WILLIAM JESSUP UNIVERSITY
Computer Science Major – Course Syllabus
CSCI-555: "Operating Systems"
(3 units)

Instructor_ Prerequisites
TBD

Course Description
The course provides a study of operating systems with all its abstraction and management design and policies relating to resource assignments. It will make use of Python for hands-on interaction with the operating system, especially on multithreading, multiprocessing and concurrency control. Particular emphasis will be given to three major OS subsystems: process management (processes, threads, CPU scheduling, synchronization, and deadlock), memory management (segmentation, paging, swapping), and file systems. It covers advanced topics in concurrency, deadlock protection, multiprocessor scheduling, computer system modeling, and virtual memory management from the operating systems viewpoint.

Course Objectives/Outcomes
Upon completion of the course, students will have learned:

- how to improve performance with the use of multithreading and multiprocessing
- how to affect the performance of programs with efficient use of the operating systems
- how to interact with multiple operating systems
- how to write efficient programs
- understand the workings of the major components of an OS

Textbook

Operating Systems: Three Easy Pieces
Remzi H. Arpaci-Dusseau and Andrea C. Arpaci-Dusseau
Arpaci-Dusseau Books
March, 2015 (Version 1.00)
http://pages.cs.wisc.edu/~remzi/OSTEP/

Supplemental Internet Resources
The Internet may be used to find additional resources. Course participants are encouraged to alert others in the class when a true gem is found. This is best accomplished through the use of the *course e-mail or other online tool* (TBD). Please take the time to check regularly (at least weekly) for new posts.

Course Content

Overview of Operating Systems
Memory Management

- Construction of a simple OS Memory Manager
- Page management and Process Management of memory
- Page Replacement Policy - FIFO and LRU

Concurrent Programming
Threads and Synchronizations
Locks, RLocks, Semaphores, Events and Conditions
Message Passing
Multiprocessing – pools, Map and Reduce
Distributed OS and Distributing Computing
File Management - a simple File System
Performance issues with File Management