Syllabus and Schedule

Operating Systems

Course Description and outcomes

Course Description

The operating system provides an established, convenient, and efficient interface between user programs and the bare hardware of the computer on which they run. The operating system is responsible for sharing resources (e.g., disks, networks, and processors), providing common services needed by many different programs (e.g., file service, the ability to start or stop processes, and access to the printer), and protecting individual programs from interfering with one another.

The course makes 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. Look into operating system support for distributed and cloud systems.

Course Objectives/Outcomes

- Learn the advanced features of Python with respect to multiple threads, multiple processes, concurrent and parallel execution of programs.
- Learn the thread and process management features of operating systems.
- Learn resource management and the various contention issues like deadlock.
- Learn about programming with distributed and cloud systems
- Learn about file systems - design and management
- Learn about distributed and cloud systems programming

Useful Textbook

- Silberschatz, Galvin and Gagne, *Operating Systems Concepts Essentials*
- Tanenbaum, *Operating Systems: Design and Implementation*

Week	Topic	Test
1	• Overview of Operating Systems • Python Environment • Setting up MS VS Code • Memory Management	
2	• Memory Management	
3	• Memory Management	
4	• Threading • Resource Management	Test1(memory management)
5	• Threading • Synchronization • Resource Management and deadlock	
6	• Multiprocessing 1	Test2 (threading)
7	• Multiprocessing 2	
8	• Multiprocessing 3	
9	• Process Management	Test3(multiprocessing)
10	Process Management	
11	File Management	
12	File Management	
13-15	Distributed and Cloud Systems	

ATTENTION:
Reserve the right to Change topics and Schedule

About written exercises, class exercises and coding assignments – all about moodle

- Written exercises are usually due in about 2 days.
  - Usually it is in the form of a single question and it normally takes about a page with diagrams to explain
  - Example: How does python know where to find the “import”..
  - ***The exercises are given within the class at any time. A moodle assignment is associated with each written exercise. Sometimes 2 or 3 per class.***
  - Direct copy and paste are not allowed. Use your own words. Rephrase it.
- Class exercises are due about 15 mins after the end of the class
  - Some class exercises are whiteboarding with no access to internet, presentation, etc
- Code assignments are due in about 6 days.
  - IF you find a copy in the internet, I can find it too. If you ask a question in stackExchange, I will find it.

- Plagiarism checking rules apply.

Tests

- It is a combination of written and coding test
- Closed book
  - Anything submitted to Moodle is allowed to be access
  - No access to anything external
  - Attempt to access anything else will be considered as “Cheating”.
- Tests are submitted to Moodle at the end of class
- About 2-3 days advance notice of test