

The following schedule may be aspirational; we will cover most of these topics, but perhaps on different days in response to student progress.

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|------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Tue Aug 30 | Intro, syllabus, 216 review: pipe, fork, exec, file descriptors, etc.                                                         | <i>Read: Chapter 1-1.1</i>                    |
| Wed Aug 31 | Quiz: 216 basics: C, printf, pointers, sizeof, for loops, preprocessor symbols, const. Project setup help. git install. unix. |                                               |
| Thu Sep 1  | Basic vocabulary, overview, interrupts                                                                                        | <i>Read: Chapter 2-2.2</i>                    |
| Fri Sep 2  | PZ Due (Make it compile, submit, for all students not waitlisted.)                                                            |                                               |
| Mon Sep 5  | No class: Labor day                                                                                                           |                                               |
| Tue Sep 6  | System types and history, unix commands review                                                                                | <i>Read: Chapter 1.3 Watch: "216: malloc"</i> |
| Wed Sep 7  | GeekOS P1 intro (Fork and Exec) GeekOS P0 questions, installation, hints. Ubuntu vm if needed.                                |                                               |
| Thu Sep 8  | Processes, PCBs, process isolation.                                                                                           | <i>Read: Chapter 2.3</i>                      |
| Fri Sep 9  | P0 Due. (File descriptors and Pipe) Waitlisted students may take until the following wednesday.                               |                                               |
| Mon Sep 12 | Quiz: 216 basics: system calls. Watch: "216: timing"                                                                          |                                               |
| Tue Sep 13 | Interprocess communication: pipes, messages, signals.                                                                         | <i>Read: Chapter 3.2-3.4</i>                  |
| Wed Sep 14 | Quiz: unix command basics: find, chmod, svn, grep, xargs, ls, cd;                                                             |                                               |
| Thu Sep 15 | Sockets and Threads                                                                                                           | <i>Read: Chapter 4.1-4.3</i>                  |
| Mon Sep 19 | P1 questions; Watch: "412: Synchronization Overview"                                                                          |                                               |
| Tue Sep 20 | Processor Scheduling, Multi-level feedback queues.                                                                            | <i>Read: Chapter 7.1</i>                      |
| Wed Sep 21 | P2 intro (Signals) Watch: "412: Semaphore Interface"                                                                          |                                               |
| Thu Sep 22 | Linux threads, Synchronization operations                                                                                     | <i>Read: Chapter 5</i>                        |
| Fri Sep 23 | P1 due. (Fork, Exec, and Pipes)                                                                                               |                                               |
| Mon Sep 26 | Watch: "412: Semaphore Implementation"                                                                                        |                                               |
| Tue Sep 27 | Spinlocks; implementation of synchronization, producer consumer, reader-writer locks                                          | <i>Read: Chapter 5.6</i>                      |
| Wed Sep 28 | Quiz: semaphores, P2 questions                                                                                                |                                               |
| Thu Sep 29 | Implementation of Monitors, Deadlock Conditions                                                                               | <i>Read: Chapter 6.2</i>                      |
| Fri Sep 30 |                                                                                                                               |                                               |
| Mon Oct 3  | P3 intro: Per-CPU Variables                                                                                                   |                                               |
| Tue Oct 4  | Deadlock Prevention and Avoidance, Banker's,                                                                                  | <i>Read: Chapter 6.2</i>                      |
| Wed Oct 5  | In-class assembly exercise                                                                                                    |                                               |
| Thu Oct 6  | Dining philosophers, Transactions, 2-phase locking.                                                                           | <i>Read: Chapter 6-6.2, p590</i>              |
| Fri Oct 7  | P2 due. (Signals)                                                                                                             |                                               |
| Mon Oct 10 | P3 questions                                                                                                                  |                                               |
| Tue Oct 11 | Midterm 1: scheduling, synchronization, deadlock                                                                              |                                               |
| Wed Oct 12 |                                                                                                                               |                                               |

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| Thu Oct 13 | Midterm review, Page replacement                                                        |                                                                                                                                                                                                                                                                                                                          |
| Mon Oct 17 | P3 questions, P4 description                                                            |                                                                                                                                                                                                                                                                                                                          |
| Tue Oct 18 | Memory: hierarchy, segmentation, fragmentation, virtual memory                          | <i>Read: Chapter 8-8.3</i>                                                                                                                                                                                                                                                                                               |
| Wed Oct 19 | No section.                                                                             |                                                                                                                                                                                                                                                                                                                          |
| Thu Oct 20 | Paging to disk, Belady's anomaly, mincore()                                             | <i>Read: Chapter 9.5, 9.7, man mincore</i>                                                                                                                                                                                                                                                                               |
| Fri Oct 21 | P3 due. (Per-CPU variables, scheduler)                                                  |                                                                                                                                                                                                                                                                                                                          |
| Mon Oct 24 | P4 description, virtual memory                                                          |                                                                                                                                                                                                                                                                                                                          |
| Tue Oct 25 | Files, inodes, soft and hard links, disks                                               | <i>Read: Chapter 11-11.2</i>                                                                                                                                                                                                                                                                                             |
| Wed Oct 26 | Quiz: Intel virtual memory                                                              |                                                                                                                                                                                                                                                                                                                          |
| Thu Oct 27 | File systems, FAT, UFS, FFS, Journaling                                                 | <i>Read: Chapter 13</i>                                                                                                                                                                                                                                                                                                  |
| Mon Oct 31 | P4 virtual memory init:                                                                 |                                                                                                                                                                                                                                                                                                                          |
| Tue Nov 1  | Log structured file system                                                              | <i>Read: <a href="http://www.stanford.edu/~ouster/cgi-bin/papers/lfs.pdf">http://www.stanford.edu/~ouster/cgi-bin/papers/lfs.pdf</a></i>                                                                                                                                                                                 |
| Wed Nov 2  | P4 questions (you will have P4 questions).                                              |                                                                                                                                                                                                                                                                                                                          |
| Thu Nov 3  | Virtual file system, fragmentation, disk scheduling, elevator.                          | <i>Read: Chapter 12.1</i>                                                                                                                                                                                                                                                                                                |
| Fri Nov 4  | P4A due. (Virtual Memory)                                                               |                                                                                                                                                                                                                                                                                                                          |
| Mon Nov 7  | P5 intro                                                                                |                                                                                                                                                                                                                                                                                                                          |
| Tue Nov 8  | RAID                                                                                    | <i>Read: Chapter 14.2</i>                                                                                                                                                                                                                                                                                                |
| Wed Nov 9  | Quiz: File systems and inodes                                                           |                                                                                                                                                                                                                                                                                                                          |
| Thu Nov 10 | Advanced file system material, e.g., NFS, FUSE, LVM                                     |                                                                                                                                                                                                                                                                                                                          |
| Fri Nov 11 | P4B due. (Paging to disk)                                                               |                                                                                                                                                                                                                                                                                                                          |
| Mon Nov 14 | In-class programming: P5                                                                |                                                                                                                                                                                                                                                                                                                          |
| Tue Nov 15 | Basic security: Diffie Hellman, password storage, users                                 | <i>Read: <a href="http://en.wikipedia.org/wiki/Crypt_(Unix)#Traditional_DES-based_scheme">http://en.wikipedia.org/wiki/Crypt_(Unix)#Traditional_DES-based_scheme</a></i><br><i>Read: <a href="http://en.wikipedia.org/wiki/Diffie-Hellman_key_exchange">http://en.wikipedia.org/wiki/Diffie-Hellman_key_exchange</a></i> |
| Wed Nov 16 | No section.                                                                             |                                                                                                                                                                                                                                                                                                                          |
| Thu Nov 17 | Midterm II: Memory, files.                                                              |                                                                                                                                                                                                                                                                                                                          |
| Mon Nov 21 | P5 questions                                                                            |                                                                                                                                                                                                                                                                                                                          |
| Tue Nov 22 | Midterm II review                                                                       |                                                                                                                                                                                                                                                                                                                          |
| Wed Nov 23 | No section                                                                              |                                                                                                                                                                                                                                                                                                                          |
| Thu Nov 24 | No class (thanksgiving)                                                                 |                                                                                                                                                                                                                                                                                                                          |
| Mon Nov 28 | P5 questions                                                                            |                                                                                                                                                                                                                                                                                                                          |
| Tue Nov 29 | Kerberos, permissions, worms. <i>Read: man chmod, man chown,</i>                        | <i>Read: <a href="http://en.wikipedia.org/wiki/Kerberos_(protocol)">http://en.wikipedia.org/wiki/Kerberos_(protocol)</a></i>                                                                                                                                                                                             |
| Wed Nov 30 | Watch: "216 malloc video / dynamic memory allocation in c"                              |                                                                                                                                                                                                                                                                                                                          |
| Thu Dec 1  | Kernel memory allocation: slab. <i>Read:</i>                                            | <i>Read: <a href="http://en.wikipedia.org/wiki/Slab_allocation">http://en.wikipedia.org/wiki/Slab_allocation</a></i>                                                                                                                                                                                                     |
| Fri Dec 2  | P5B due. (Filesystem Reading)                                                           |                                                                                                                                                                                                                                                                                                                          |
| Mon Dec 5  | TA's Final review.                                                                      |                                                                                                                                                                                                                                                                                                                          |
| Tue Dec 6  | Distributed systems, Two generals, Byzantine generals, Lamport clocks, Two-phase commit |                                                                                                                                                                                                                                                                                                                          |
| Wed Dec 7  |                                                                                         |                                                                                                                                                                                                                                                                                                                          |
| Thu Dec 8  | Final review                                                                            |                                                                                                                                                                                                                                                                                                                          |
| Fri Dec 9  | P5C due. (Filesystem Writing)                                                           |                                                                                                                                                                                                                                                                                                                          |
| Wed Dec 14 | Final Exam 08:00 AM                                                                     |                                                                                                                                                                                                                                                                                                                          |