Toggle navigation 6.1810: Operating System Engineering

- **Schedule**
- **Class**
  - Overview
  - Administrivia
  - Handin website
  - 6.S081 2021
- **Labs**
  - Tools
  - Guidance
  - Lab Utilities
  - Lab System calls
  - Lab Page tables
  - Lab Traps
  - Lab Copy on-write
  - Lab Multithreading
  - Lab network driver
  - Lab Lock
  - Lab File system
  - Lab mmap
- **xv6**
  - xv6
  - xv6 book
- **References**
- **Piazza**

2022

Links to notes, videos etc. on future days are copies of materials from the 2021 version of 6.1810 (which was called 6.S081 then). We will update the notes as the course progresses. The lecture notes may help you remember the lecture content, but they are *not* a replacement for attending lectures.

Monday	Tuesday	Wednesday	Thursday	Friday
sep 5 Labor Day	sep 6 Reg Day	sep 7 **LEC 1 (rtm):** Introduction and examples (handouts: xv6 book) **Preparation**: Read chapter 1 (for your amusement: Unix) **Homework 1 due:** Question **Assignment**: Lab util: Unix utilities	sep 8	sep 9
sep 12 **LEC 2 (fk):** C in xv6 and examples **Preparation**: 2.9 (Bitwise operators) and 5.1 (Pointers and addresses) through 5.6 (Pointer arrays) and 6.4 (pointers to structures) by Kernighan	sep 13	sep 14 **LEC 3 (fk):** OS design **Preparation**: Read chapter 2 and xv6 code: kernel/proc.h, kernel/defs.h, kernel/entry.S, kernel/main.c, user/initcode.S, user/init.c, and skim	sep 15 **DUE**: Lab util	sep 16

and Ritchie (K&R)		kernel/proc.c and kernel/exec.c **Homework 2 due:** Question **Assignment**: Lab syscall: System calls		
sep 19 **LEC 4 (fk):** page tables **Preparation**: Read Chapter 3 and kernel/memlayout.h, kernel/vm.c, kernel/kalloc.c, kernel/riscv.h, and kernel/exec.c **Homework 3 due:** Question	sep 20	sep 21 **LEC 5 (TAs):** GDB Calling conventions **Preparation**: Read Calling Convention **Assignment**: Lab pgtbl: Page tables	sep 22 **DUE**: Lab syscall	sep 23
sep 26 **LEC 6 (rtm):** System call entry/exit **Preparation**: Read Chapter 4, except 4.6 and kernel/riscv.h, kernel/trampoline.S, and kernel/trap.c **Homework 4 due:** Question	sep 27	sep 28 **LEC 7 (fk):** Page faults **Preparation**: Read Section 4.6 **Homework 5 due:** Question **Assignment**: Lab traps: Traps	sep 29 **DUE**: Lab pgtbl	sep 30
oct 3 **LEC 8 (fk):** Q&A labs **Homework 6 due:** Question	oct 4	oct 5 **LEC 9 (fk):** Device drivers **Preparation**: Read Chapter 5 and kernel/kernelvec.S, kernel/plic.c, kernel/console.c, kernel/uart.c, kernel/printf.c **Homework 7 due:** Question **Assignment**: Lab cow: Copy-on-write fork	oct 6 **DUE**: Lab traps	oct 7 ADD DATE
oct 10 Indigenous Peoples Day	oct 11	oct 12 **LEC 10 (fk):** Locking **Preparation**: Read "Locking" with kernel/spinlock.h and kernel/spinlock.c **Homework 8 due:** Question	oct 13	oct 14
oct 17 Hacking day: no class meeting; work on the lab	oct 18	oct 19 **LEC 11 (rtm):** Scheduling 1 **Preparation**: Read "Scheduling" through Section 7.4, and kernel/proc.c, kernel/swtch.S **Homework 9 due:** Question **Assignment**: Lab thread: Multithreading	oct 20 **DUE**: Lab cow	oct 21
oct 24 **LEC 12 (rtm):** Scheduling 2 (2020: notes, code, video) **Preparation**: Read remainder of "Scheduling", and corresponding parts of kernel/proc.c, kernel/sleeplock.c **Homework 10 due:** Question	oct 25	oct 26 **LEC 13 (rtm):** Q&A labs **Homework 11 due:** Question **Assignment**: Lab net: Network driver	oct 27 **DUE**: Lab thread	oct 28
oct 31 **LEC 14 (fk):** File systems **Preparation**: Read kernel/bio.c, kernel/fs.c, kernel/sysfile.c, kernel/file.c and "File system" (except for the logging sections) **Homework 12 due:** Question	nov 1	nov 2 **LEC 15 (fk):** Crash recovery **Preparation**: Read kernel/log.c and the logging sections of the "File system" chapter **Homework 13 due:** Question	nov 3	nov 4
nov 7	nov 8	nov 9	nov 10	nov 11

LEC 16 (rtm): File system performance and fast crash recovery **Preparation**: Read Journaling the Linux ext2fs Filesystem (1998) **Homework 14 due:** Question	**DUE**: Lab net	**LEC 17 (fk):** Virtual memory for applications (baker example) **Preparation**: Read Virtual Memory Primitives for User Programs (1991) **Homework 15 due:** Question **Assignment**: Lab lock: Parallelism/locking		Veteran's Day
nov 14 **LEC 18 (rtm):** OS Organization **Preparation**: Read The Performance of micro-Kernel-Based Systems (1997) **Homework 16 due:** Question	nov 15	nov 16 **LEC 19 (rtm):** Virtual Machines **Preparation**: Read Dune: Safe User-level Access to Privileged CPU Features (2012) **Homework 17 due:** Question **Assignment**: Lab fs: File system	nov 17 **DUE**: Lab lock	nov 18
nov 21 **LEC 20 (fk):** Kernels and HLL **Preparation**: Read the Biscuit paper (2018), FAQ **Homework 18 due:** Question	nov 22	nov 23 **DROP DATE** Hacking day: no class meeting; work on the lab	nov 24 - nov 25 Thanksgiving	
nov 28 **LEC 21 (rtm):** Networking **Preparation**: Read Receive Livelock (1996) **Homework 19 due:** Question	nov 29	nov 30 **LEC 22 (rtm):** Meltdown **Preparation**: Read Meltdown (2018) **Homework 20 due:** Question **DUE**: Lab fs **Assignment**: Lab mmap: Mmap	dec 1	dec 2
dec 5 **LEC 23 (rtm):** Multi-Core scalability and RCU **Preparation**: Read RCU paper (2013), FAQ **Homework 21 due:** Question	dec 6	dec 7 Hacking day: no class meeting; work on the lab	dec 8	dec 9
dec 12 Hacking day: no class meeting; work on the lab	dec 13 **DUE**: Lab mmap	dec 14 LAST DAY OF CLASSES **LEC 24 (TAs):** Current Research: SigmaOS	dec 15	dec 16

Questions or comments regarding 6.1810? Send e-mail to the course staff at *61810-staff@lists.csail.mit.edu*.

Top // **6.1810 home** // *Last updated Monday, 05-Dec-2022 14:59:00 EST*