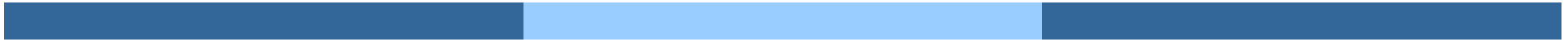
Operating Systems



Operating Systems
Wenbo Shen

Course Info

- Instructor –
  - Wenbo Shen; https://wenboshen.org/, shenwenbo@zju.edu.cn
- Class hour: Mon 16:15-17:50 Tu 14:15-15:50
- Lab hour: Tu 16:15-17:50
- TA:
  - Xingkai Wang
  - Ruorong Guo
  - Zichen Zhao
  - Ganhao Chen
- Class website: https://courses.zju.edu.cn

whoami

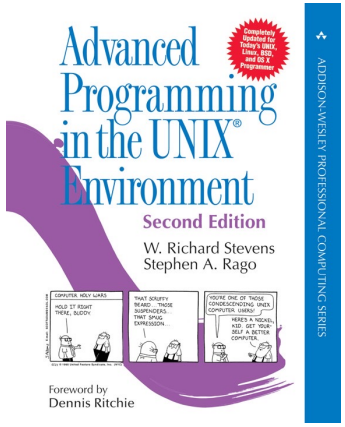
- Wenbo Shen (申文博)
  - A Zhejiang University 100 Young Professor
  - A system security researcher
  - A kernel programmer
- R&D highlights
  - Tech lead of Samsung Knox Kernel, Silicon Valley (4 years)
    - Design and implement features protecting 100+ million flagship devices
  - Control flow protection: first in mobile industry, shipped in 2016
    - Google Pixel catches up partially by end of 2018
  - Publications in all top4: IEEE S&P, ACM CCS, USENIX Sec, NDSS
    - TZ based RKP(CCS 14), SKEE (NDSS 16), XOM (S&P 13, 17), Kernel(USENIX Sec19, 23)，Container (CCS 21, 22, 23)
- Education
  - PhD from North Carolina State University, USA, 2015
  - BE from Harbin Institute of Technology (哈工大), Harbin, 2010

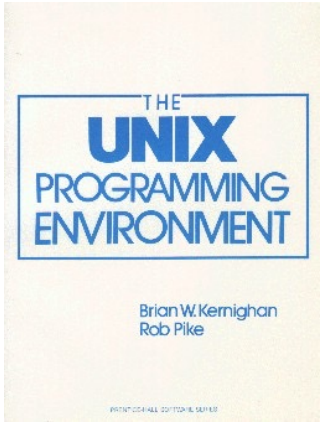
Learning Objectives

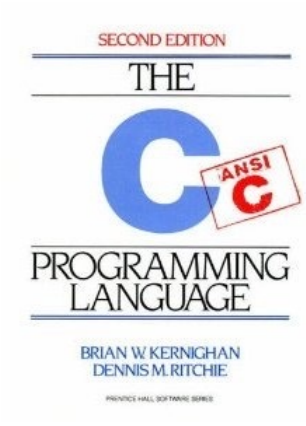
- Understand operating system concepts
  - process management, CPU scheduling, multi-threading, synchronization
  - memory management, physical memory, virtual memory
  - file systems…
- Get a deep understanding of how the real-world operating systems work
  - You can never truly understand a concept unless you implemented (CODE) it

Prerequisites

- Assembly, C, Data structures
- Programming skills:
  - proficiency in the C programming language
  - proficiency in UNIX(Linux) programming and debugging



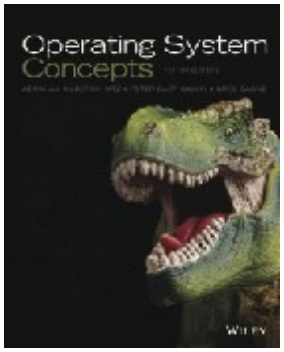




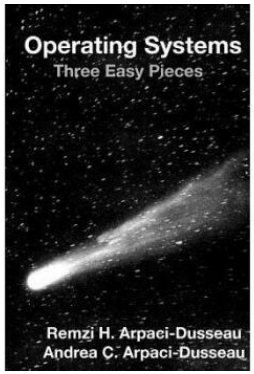
- Or you are willing to learn

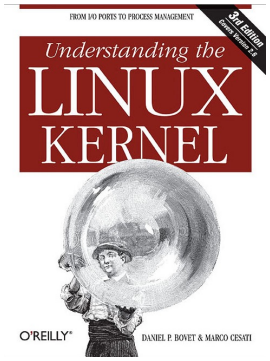
Course Material

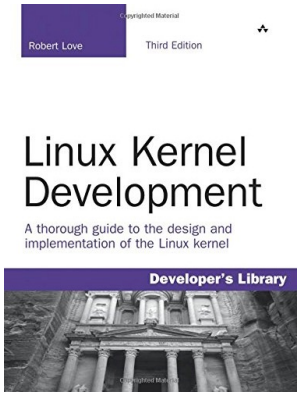
- Lecture notes (posted at the class website)
- Textbook: Operating System Concepts



- Very useful it you do Linux kernel programming:

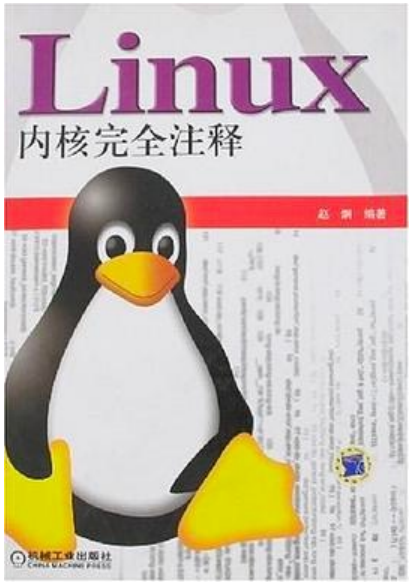


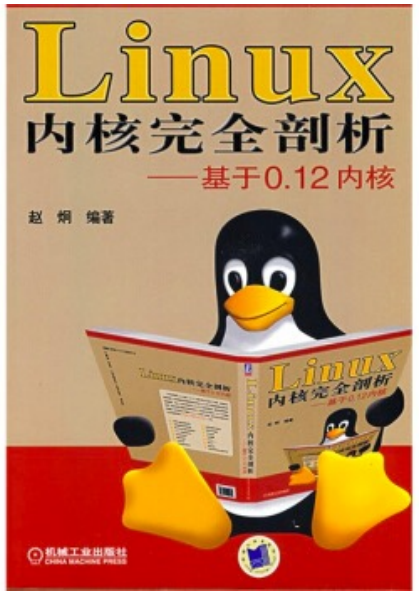




Grading

- Final Exam – 50 points
- ~~Homework – 10 points~~
- ~~Project – 40 points~~
- Project – 50 points
  - You are in the advanced class
  - Implement Linux0.11 on RISC-V 64-bit





Exams

- No midterm exam
- One final exam, close book
- Final exam is comprehensive/cumulative

Your Responsibilities

- Understand lecture & reading materials
- Ask for extra help (talk to me or TA), if needed
  - if the class is too hard or you do not have necessary backgrounds
- Uphold academic integrity
- Turn in your assignments on time
- Check class web page regularly

Dos and Don’ts

- Do share debugging experiences, knowledge of tools
- Do acknowledge help from others
- Do acknowledge sources of information from books and web pages

- Don’t cheat or help others cheat
- Don’t share code from others
  - e.g., changing variable names or indentation

Cheating policy

- Cheating is not allowed
- 实验查重
  - 每个lab都会有代码查重
  - 针对一个lab，抄袭和被抄袭者均是零分
  - 抄袭两个或以上者，抄袭和被抄袭者课程零分
- I REFER ALL ACADEMIC DISHONESTY INCIDENTS TO THE OFFICE OF STUDENT CONDUCT, WITHOUT EXCEPTION
- If you don't cheat and work hard, you will always do better than if you cheated
- Draw your own figures, use your own words and add the citation

Questions