



# CS307&CS356: Operating Systems

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上海交通大學  
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# Download lectures

- <ftp://public.sjtu.edu.cn>
- User: wuct
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- <http://www.cs.sjtu.edu.cn/~wuct/os/>

# Brief Introduction

- Work & Education Experience



- 2012-present, professor, associate professor, assistant professor, Dept. of Computer Science & Engineering, *Shanghai Jiao Tong University (SJTU)*, Shanghai, China



- 2012, Ph.D., Electrical and Computer Engineering, *Virginia Commonwealth University (VCU)*, Richmond, VA, USA



- 2010, Ph.D., Computer Architecture, *Huazhong University of Science and Technology (HUST)*, Wuhan, China

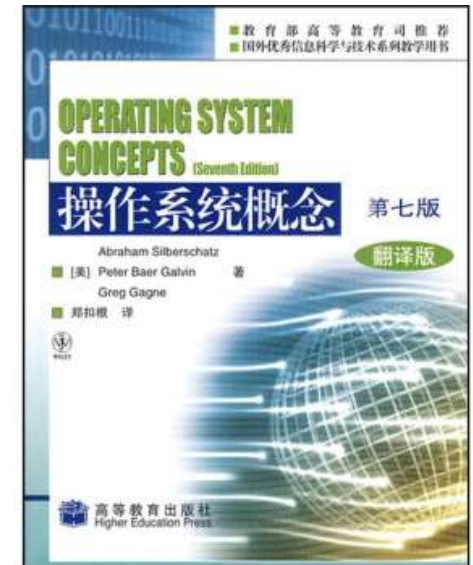
- Research Interest: **Big Data/Cloud Storage Systems**

# Welcome to Join in Our Lab

- Look for candidates under my supervision: 2-3 master/1-2 Ph.D. students per year
- From 2<sup>nd</sup> year to 4<sup>th</sup> year
- Research on **Big Data/Cloud Storage Systems**
  - **Chapters 9-15 in OS book**
  - Cloud Storage/Big Data storage devices (NAS/SAN/RAID)
  - Data Management (e.g., cache, I/O scheduling)
  - Non-Volatile Memories (e.g. Flash, Phase Change Memory, etc.)
  - Distributed File Systems (e.g., HDFS, Ceph)

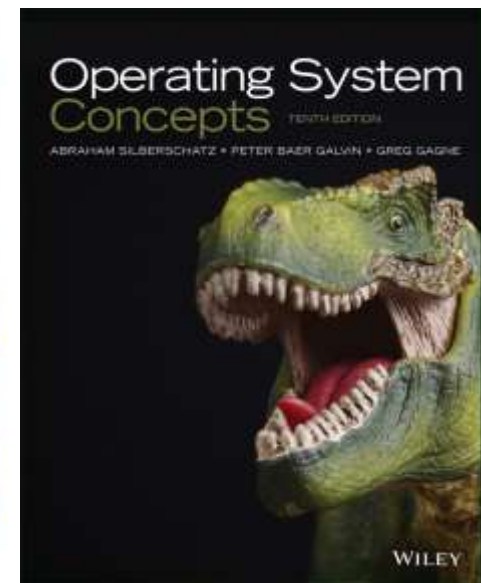
# OS Textbooks (Old)

- Operating System Concepts (7<sup>th</sup> Edition)
  - A. Silberschatz
  - P. Galvin
  - G. Gagne
  - ISBN: 978-7-040-20928-0



# OS Textbooks (New)

- Operating System Concepts (9<sup>th</sup> & 10<sup>th</sup> Edition)
  - A. Silberschatz
  - P. Galvin
  - G. Gagne
  - ISBN: 978-7-111-60436-5



# Textbooks (Electronic)

- Electronic Files of Books are available in the FTP
  - 8<sup>th</sup> Edition of the Operating System Book
  - 9<sup>th</sup> Edition of the Operating System Book
  - 10<sup>th</sup> Edition of the Operating System Book
- Due to the copyright policies, please **DO NOT** spread the PDF files.

# Syllabus (1)

- Requirements:
  - Computer Basic
  - C/C++ Programming
- Goals: Successful course participants will:
  - Understand **basic machine organization**, including processors, main memory, and input/output architecture.
  - Understand **the basics of the memory hierarchy**, including virtual memory and caches, and how these are implemented in hardware and software.



# Syllabus (2)

- Goals (contd.)
  - Understand **the core concepts of operating systems**, including processes, threads, synchronization, virtual memory policies, and file management.
  - The idea of the course is **to learn how computers really work**, from the chip level up to the application level. When we finish, you will understand what is actually happening when a computer system is running a set of programs, and will be able to make informed choices as a developer, project manager, or system customer.

# Course Meeting Time

- Lectures:
  - 4 classes per week
- Questions:
  - Ask me directly between/after the classes
  - Go to my office: SEIEE 3-513
  - Send me an email: [wuct@cs.sjtu.edu.cn](mailto:wuct@cs.sjtu.edu.cn)

# Final Grades

- Homework and Attendance 10%
  - Weekly
- Quizzes 15% (Close Book, On Classes)
  - Will be announced before two weeks
  - Three quizzes
- Project 15% (Presentation and Report)
  - Some students will be selected to give presentation on classes
- Final Exam 60% (Close Book)

# Quizzes

- 1. Schedule
  - **First Quiz: Apr. 2nd (Thursday, 5th Week)**
  - Chapter 1-3 in OS book
  - **Second Quiz: Apr. 23th (Thursday, 8th Week)**
  - Chapter 4-7 in OS book
  - **Third Quiz: May 14th (Thursday, 11th Week)**
  - Chapter 8-10 in OS book
- 2. Scores
  - Each quiz has 10 points, half points of each quiz will be calculated as a part of the final grade.

# Late Policy

- Late Policy: Deadlines will be given in each assignment. These deadlines are strict.
- Typically, homework will be given on each Monday, you should submit your homework by the next Monday.

# Projects

- 4 categories of projects (15% in the Final Grade):
  - Project 1: 3%
  - Project 2-3: 4%
  - Project 4-6: 4%
  - Project 7-8: 4%
- **Arrangement for computer room: TBA**

# Project 1

- **Project 1: Introduction to Linux Kernel Modules**
- At the end of Chapter 2 (P1-P7, textbook)
  - Deadline: Oct. 19th (Friday in the 6<sup>th</sup> Week)

# Project 2

- **Project 2-1: UNIX Shell**
- **Project 2-2: Linux Kernel Module for Task Information**
- At the end of Chapter 3(P12-P22, textbook)
  - Deadline: Nov. 2nd (Friday in the 8<sup>th</sup> Week)



# Project 3

- **Project 3-1: Multithreaded Sorting Application**
- **Project 3-2: Fork-Join Sorting Application**
- At the end of Chapter 4(P25-P28, textbook)
  - Deadline: Nov. 2nd (Friday in the 8<sup>th</sup> Week)

# Project 4

- **Project 4: Scheduling Algorithms**
- At the end of Chapter 5(P29-P31, textbook)
  - Deadline: Nov. 16th (Friday in the 10<sup>th</sup> Week)

# Project 5

- **Project 5-1: Designing a Thread Pool**
- **Project 5-2: The Producer – Consumer Problem**
- At the end of Chapter 7(P35-P44, textbook)
  - Deadline: Nov. 16th (Friday in the 10<sup>th</sup> Week)

# Project 6

- **Project 6: Banker's Algorithm**
- At the end of Chapter 8(P45-P47, textbook)
  - Deadline: Nov. 16th (Friday in the 10<sup>th</sup> Week)

# Project 7

- **Project 7: Contiguous Memory Allocation**
- At the end of Chapter 9(P48-P50, textbook)
  - Deadline: Nov. 30th (Friday in the 12<sup>th</sup> Week)

# Project 8

- **Project 8: Designing a Virtual Memory Manager**
- At the end of Chapter 10(P51-P54, textbook)
  - Deadline: Nov. 30th (Friday in the 12<sup>th</sup> Week)

# Teaching Assistants for OS

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  - Email: hermanzeng@foxmail.com
  - Mobile Phone: 13870414660
- Hanchen Guo(郭翰宸)
  - Email: 632742451@qq.com
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# Teaching Assistants for OS Projects

- Chi Zhang (张弛)
  - Email: 312925347@qq.com
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- Zhehan Lin(林哲汉)
  - Email: 373417359@qq.com
  - Mobile Phone: 13600501215