ie
SCHOOL OF
HUMAN SCIENCES
& TECHNOLOGY

OPERATING SYSTEMS & PARALLEL COMPUTING

DATA & BUSINESS ANALYTICS

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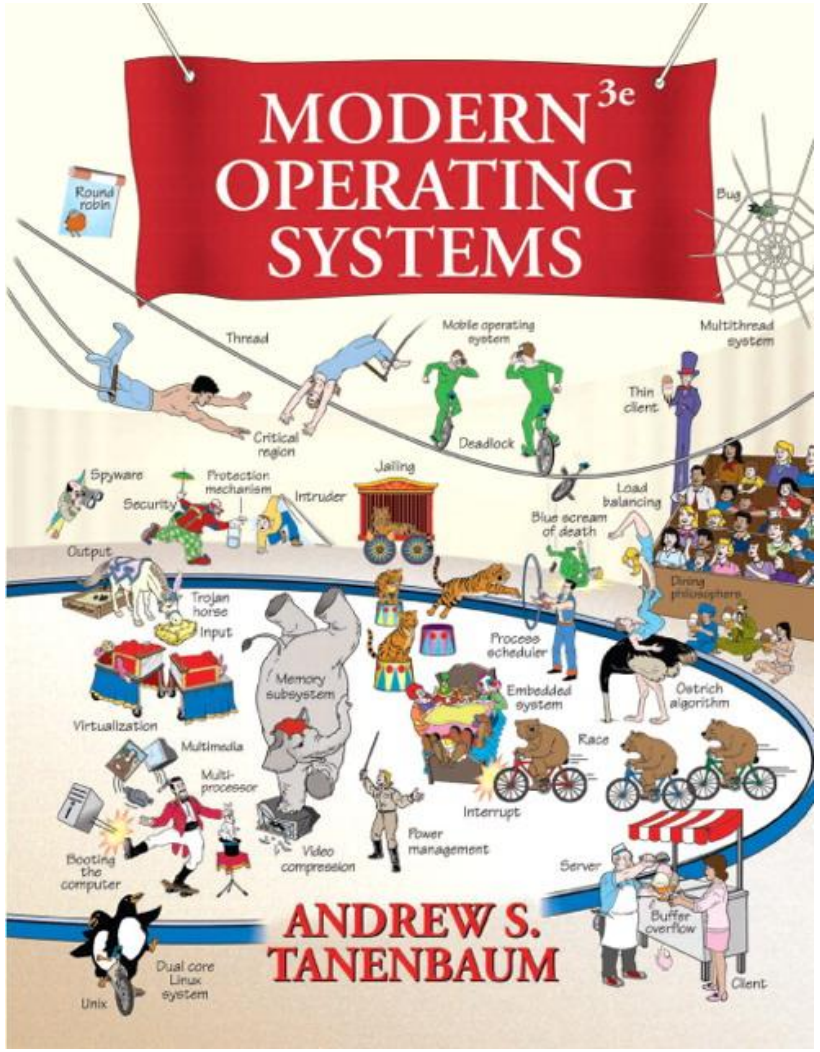
Operating Systems book

- A free online version of “Modern Operating Systems” can be downloaded from:
- https://github.com/gramasaurous/opsys/blob/master/Modern.Operating.Systems.3rd.Edition.pdf

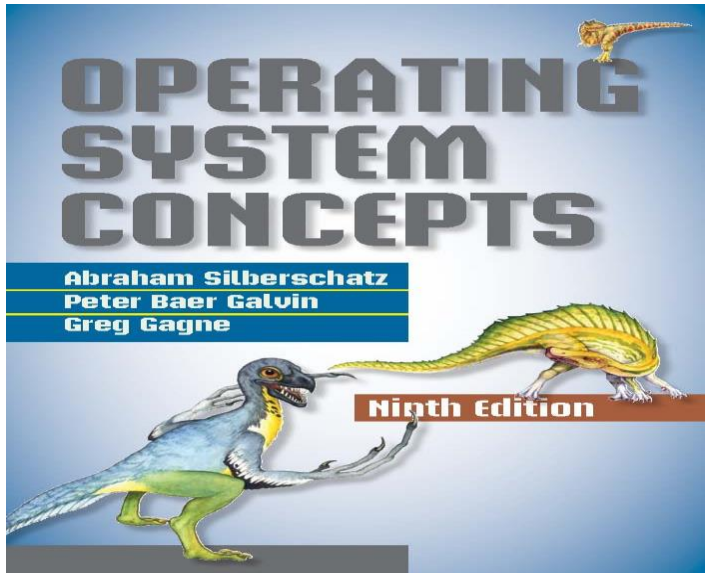
- https://github.com/gramasaurous/opsys/blob/master/MOS_3e_SM.pdf

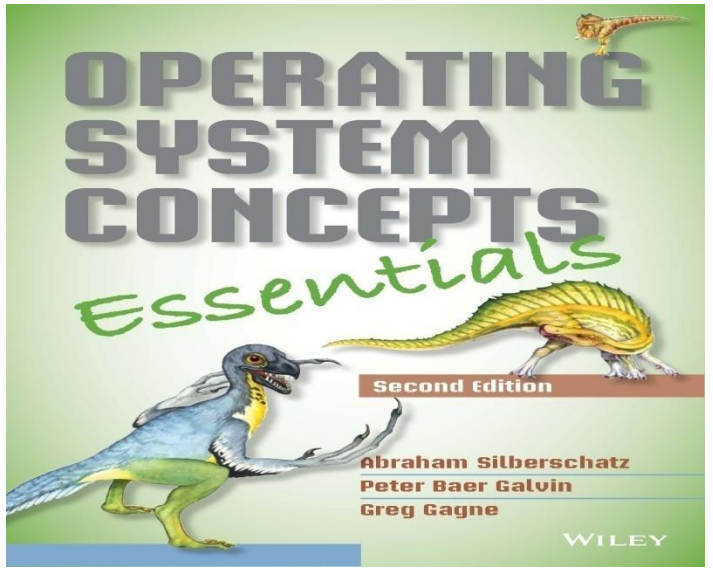


Other links (1)

- A. Silberschatz, P. B. Galvin, and G. Gagne, “Operating Systems Concepts (Essentials)”, 9th Edition, John Wiley & Sons, 2012.
- http://codex.cs.yale.edu/avi/os-book/

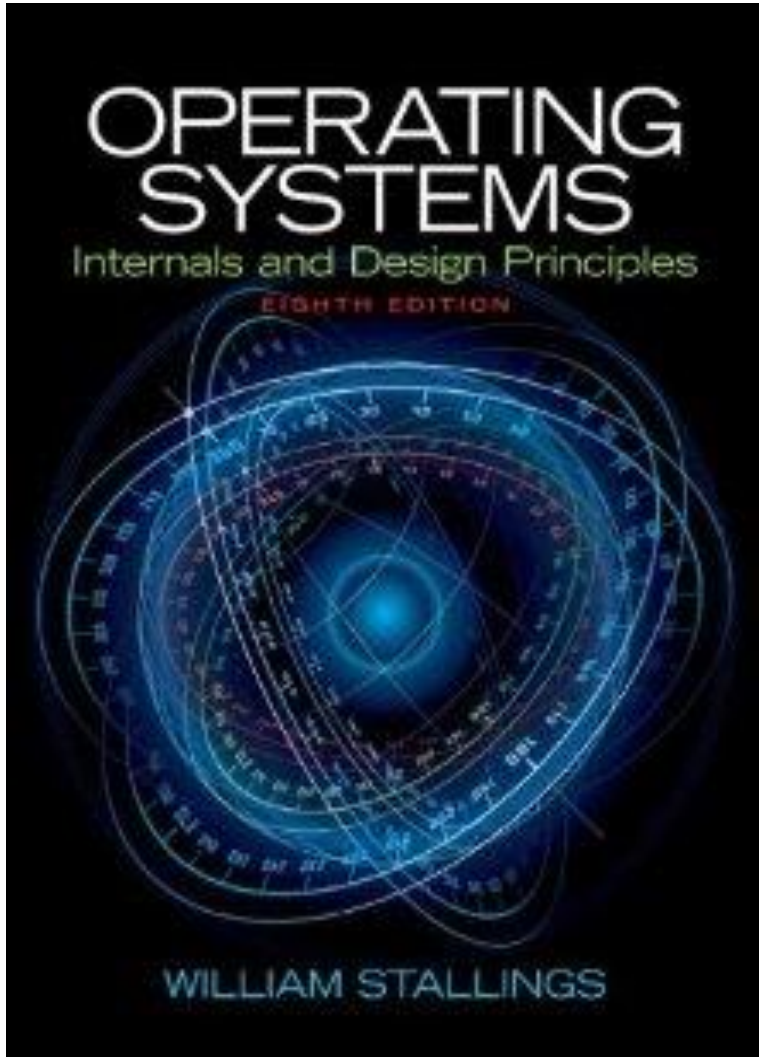
- https://www.os-book.com/OSE2/index.html
- https://www.os-book.com/OS9/index.html
- https://www.os-book.com/OS10/index.html





Other links (2)

- W. Stallings, “Operating Systems: Internals and Design Principles”, 8th ed, Pearson, 2015.
- http://williamstallings.com/OperatingSystems/



UNIT 1: INTRODUCTION

- **Sessions 1-3**
- ***Topics:***
  - Operating system principles and computer architecture.
  - Operating system kernels.
  - Processes and threads.
- ***Required Reading***
  - *Textbook*: *Modern Operating Systems (3rd Edition)*: Chapter 1-2. page 1-174

UNIT 2: OPERATING SYSTEMS DETAILS

- **Sessions 4-10**
- ***Topics:***
  - Memory Management.
  - File Systems.
  - Input/Output.
  - Deadlocks.
  - Multimedia Operating Systems.
  - Multiple Processor Systems.
  - Security
- ***Required Reading***
  - *Textbook*: *Modern Operating Systems (3rd Edition)*: Chapter 3-9.

UNIT 3: OPERATING SYSTEMS EXAMPLES

- **Sessions 11-13**
- ***Topics:***
  - Linux.
  - Windows.
  - MacOS.
  - Android.
  - iOS.
- ***Required Reading***
  - *Textbook*: *Modern Operating Systems (3rd Edition)*: Chapter 10-12.

- **Session 14**
  - **REVIEW UNITS 1, 2 & 3**

- **Session 15**
  - **PARTIAL EXAM 1**

UNIT 4: Parallel Computer Architecture

- **Sessions 16-18**
- ***Topics:***
  - shared memory systems and cache coherence
  - distributed-memory systems
  - Interconnection networks and routing
- ***Required Reading***
  - *Textbook: Parallel Programming for Multicore and Cluster Systems: Chapter 2*

UNIT 5: Programming shared-address space systems

- **Sessions 19-21**
- ***Topics:***
  - Cilk Plus
  - OpenMP
  - Pthreads
- ***Required Reading***
  - *Textbook: Parallel Programming for Multicore and Cluster Systems: Chapter 6*

UNIT 6: Programming scalable systems

- **Sessions 22-23**
- ***Topics:***
  - Message passing: MPI
  - Global address space languages.
- ***Required Reading***
  - *Textbook: Parallel Programming for Multicore and Cluster Systems: Chapter 5*

UNIT 7: Features

- **Sessions 24-27**
- ***Topics:***
  - GPU Programming
  - NVDIA: Pascal, Volta.
  - High-performance computing (HPC)
  - Cloud Solution: AWS, Azure, Google Cloud, Oracle
  - Problem solving on clusters using MapReduce (Big Data)
  - Quantum Computing.
- ***Required Reading***
  - *Textbook*: CUDA Examples and Programming

- **Session 28**
  - **Students Presentations**
- **Session 29**
  - **REVIEW UNITS 4, 5, 6 & 7**
- **Session 30**
  - **FINAL EXAM**

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