

# CSGE602055 Operating Systems

## CSF2600505 Sistem Operasi

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# Agenda

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- 8 General View
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- UILA: since 1984.
- GNU/Linux user: since 1994.
- VauLSMorg (vlsm.org): since 1996.
- Blog: `rahmatm.samik-ibrahim.vlsm.org/`
  - Blog: 2016/08/panggil-saya-rahmat.html
  - Blog: 2013/10/kumpulan-hal.html
- Twitter: @rms46
- Facebook Page: `facebook.com/RMS46F/`
- Contact: via SCELE - Operating Systems REG/MTX/INT/EXT  
`https://scele.cs.ui.ac.id/course/view.php?id=124`

# Terms of Conditions

- 1 My name is Rahmat. There shall no other name then Rahmat!
- 2 Thou shall not be late for the lecture!
- 3 Thou shall not swear and not be noisy in the classroom!
- 4 Remember the Operating System time slot. Prepare for a quiz!
- 5 Honour thy lecturer's privacy. No Puss in Boots, please!
- 6 Thou shall not play games in the classroom!
- 7 Thou shall not net chatting in the classroom!
- 8 Thou shall not borrow from your neighbour during a quiz or examination!
- 9 Thou shall not wrongly answer the quiz or examination!
- 10 Thou shall not covet your neighbour's quiz or examination sheet!

# Honour thy lecturer's privacy.

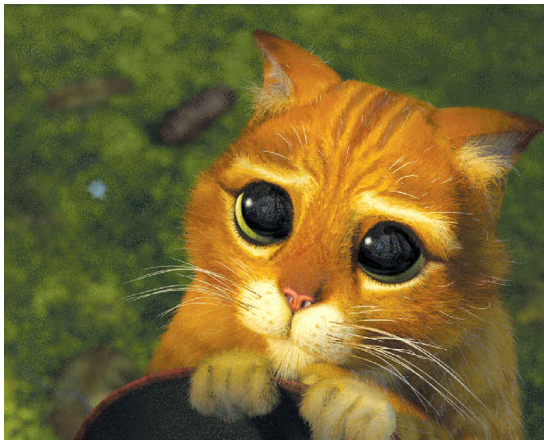


Figure : No Puss in Boot, please!<sup>1</sup>.

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<sup>1</sup>This is a fair use of a DreamWorks/Paramount Picture character.

# Goal

## Coverage

This is an introduction to a modern operating systems course. It will cover general overview, computer architecture review, operating system overview, software licenses, GNU/Linux CLI, versioning, scripting, C language overview, protection, security, gnupg, processes and threads, addressing and pointers, memory management, virtual memory, synchronization, mutual exclusion, deadlock, CPU scheduling algorithms, file systems.

## Student-Centered

This course is student-centered where responsibility is in the hands of the students. Students are expected to be prepared for the class meeting.

## GNU/Linux

Students will have a thorough understanding of how GNU/Linux provides services by using a Command Line Interface.

- SCELE: <https://scele.cs.ui.ac.id/course/view.php?id=124>
  - Enrolment key: "01101010"<sup>1</sup>.
  - Check the "Announcement" regularly.
  - Topic of the week will be in the weeks section.
- ARCHIVE:  
<https://scele.cs.ui.ac.id/course/view.php?id=126>
  - Enrolment key: "11001100"<sup>1</sup>.
  - Check it out!
- There will be **No Lab. Assistant.**
- There will be **No Teaching Assistant.**
- There will be **Grader only.**
- Go to SEKRE (B Building 2nd floor) for any administrative issues!

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<sup>1</sup>For a limited time only!

- Any recent Operating System text book published - say - less than 10 years ago.
- OLD — (ARSIP)(017\_BAHAN-AJAR-LAMA) Previous Slides.
- OSC2E — (ARSIP)(050\_OSC-Silberschatz) OSC2E
- UCB — (ARSIP)(070\_KULIAH-INTERNASIONAL) UC Berkeley
- UDA — (ARSIP)(070\_KULIAH-INTERNASIONAL) UDACITY
- ETC — (ARSIP)(075\_ETC-Video) ETC



# Schedule

- Week00 – Intro (OSCE2e ch1/2)(UCB 01)(UDA P1L1/2) (OLD 00)
- Week01 – IPR, CLI, GIT, Scripting (ETC 000 001 002) (OLD 02-HKI 02-scripting) + Any Scripting - Git - AWK - SED - REGEX Tutorial.
- Week02 – Protection & Security (OSCE2e ch13/14) (ETC 050 051) + Any C Language Tutorial
- Week03 – Boot and StarUp ()
- Week04 – I/O Programming, Addressing & Pointer (Any C Language Tutorial)
- Week05 – Memory (OSCE2e ch7/8) (UCB 11 12 13) (UDA P3L2)
- UTS 00 01 02 03 04 05
- Week06 – Processes & Threads (OSCE2e ch3/4) (UCB 02 03) (UDA P2L1/2/3)
- Week07 – Synchronization (OSCE2e ch5) (UCB 7/8) (UDA P3L3/4)
- Week08 – Scheduling (OSCE2e ch6) (UCB 9/10) (UDA P3L1)
- Week09 – File dan Storage System (OSCE2e ch9/10/11) (UCB 17A/18/19) (UDA P4L2 P4L2)
- Week10 – Sockets, Cloud System & Virtualization (UCB 24)

# Week 00: Introduction

- Reference: (OSCE2e ch1/2)(UCB 01)(UDA P1L1/2)(OLD 00)
- Operating System
  - Definition
  - Managers
  - Layers
  - Interfaces
- Computer Organization Review
  - Buses, Bridges, Transfer Rate, Clock.
  - Memory: DDR, DDR-2, ...
  - Port & Memory Mapped I/O
  - CPU: privilege and user mode
  - Hardware Limitation
  - Priority: Read vs Write
  - Numbers: base 2, base 8, base 10, base 16.
- Lab
  - Google Account
  - Github Account
  - SSO (LDAP) Account
  - Scele Account

# Week 01: IPR & Scripting

- Reference: (ETC 000 001 002)(OLD 02-HKI 02-scripting) (Any Related Tutorial)
- Intellectual Property Right (IPR)
  - Patent, Copyright, Trademark, Service-mark, Trade-secret.
  - Software Licences
  - Free Software Definition (FSF)
  - Free Software, Open Source Software, Copyleft Software
- The GNU/Linux Command Line Interface (CLI)
  - shell (Bash)
  - basic cli: cat, cd, cp, ls, man, more, mv, rm, touch, wc.
  - vi, sed, awk, git.
  - regex
- Lab
  - editor exercise
  - git: pull, commit
  - git: 11 weekly folders + 1 SandBox
  - simple scripts
  - git push to github

# Week 02: Protection & Security

- Reference: (OSCE2e ch13/14) (ETC 050 051) (Any C Language Tutorial)
- Goals and Principles of Protection
  - Principle of Least Privilege
  - Domain Structure and Access Matrix
- The Security Problem
  - Security Violation Categories
  - Security Measure Levels
  - Encryption
- gnupg
- sha1sum
- encryption
- C language
- Lab
  - gpg, sha1sum, tar

- Week03 – Boot and StarUp ()
- bios
- UEFI
- grub
- log

- Week04 – I/O Programming, Addressing & Pointer (Any C Language Tutorial)
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- Week05 – Memory (OSCE2e ch7/8) (UCB 11 12 13) (UDA P3L2)
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- Week06 – Processes & Threads (OSCE2e ch3/4) (UCB 02 03) (UDA P2L1/2/3)
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- Week07 – Synchronization (OSCE2e ch5) (UCB 7/8) (UDA P3L3/4)
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- Week08 – Scheduling (OSCE2e ch6) (UCB 9/10) (UDA P3L1)
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- Week09 – File dan Storage System (OSCE2e ch9/10/11) (UCB 17A/18/19) (UDA P4L2 P4L2)
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- Week10 – Sockets, Cloud System & Virtualization (UCB 24)
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85 - ... = A	80 - 85 = A-	75 - 80 = B+	70 - 75 = B
65 - 70 = B-	60 - 65 = C+	55 - 60 = C	50 - 55 = D or C <sup>1</sup>

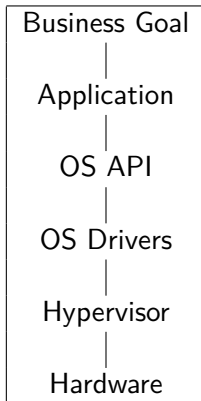
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- Midterm: 6 problem sets @ 6 points (=36).
- Final: 5 problem sets @ 6 points (=30).
- Pre-midterm assignments: 6 sets @ 3 points (=18).
- Post-midterm assignments: 5 sets @ 3 points (=15).
- Extra: 1 point<sup>1</sup>.
- C-2C: up to 5 points<sup>1</sup>.
- Midterm remedy/replacement: upto 3 points<sup>1</sup>.
- Final remedy/replacement: upto 3 points<sup>1</sup>.
- You are allowed to bring a cheat-sheet (A4 size) to the exam room<sup>1</sup>.

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<sup>1</sup>Terms and conditions apply

# General View



- Account: Google, Github, SSO
- Scele
- Report/Wait
- Home check

- Base 2:  $110010101010_2$
- Base 8:  $01234567_8 = 000\ 001\ 010\ 011\ 100\ 101\ 110\ 111_2$
- Base 10:  $012\ 345\ 679$
- Base 16:  $9AB\ CDEF_{16} = 1001\ 1010\ 1011\ 1100\ 1101\ 1110\ 1111_2$

# The End

- This is the end of the presentation.