

Computer System Administration

蔡孟勳 (tsaimh)

國立陽明交通大學資工系資訊中心

Information Technology Center, Department of Computer Science, NYCU



計算機系統管理這門課值得修嗎？



計算機系統管理是一門相當重要的課程，特別是對於想要從事計算機相關職業的人來說。以下是我個人的幾點觀點，供您參考：



1. 系統管理是相當實用的技能：系統管理是指對計算機系統進行維護、管理和監控的過程。在現今的資訊化社會中，幾乎所有的企業和組織都需要有人來負責系統管理。因此，學習系統管理是相當實用的技能，可以增加你在職場上的競爭力。
2. 系統管理是相當廣泛的領域：系統管理涉及許多不同的領域，包括硬體、軟體、網路、安全等等。因此，學習系統管理可以幫助你了解這些不同領域的相互作用和關聯，從而更好地瞭解計算機系統的運作原理。
3. 系統管理可以幫助你解決問題：當計算機系統出現問題時，系統管理人員需要能夠快速且有效地解決問題。學習系統管理可以幫助你瞭解常見的系統問題，以及如何解決這些問題。

總體而言，我認為計算機系統管理是一門非常值得學習的課程。如果你有興趣從事計算機相關職業，或者想更深入地瞭解計算機系統的運作原理，那麼學習系統管理會是一個不錯的選擇。



查看其他草稿



計算機系統管理是一門重要的計算機課程，涵蓋了計算機系統的管理和維護。該課程對於任何想要在計算機系統領域工作的人來說都是必修課。

計算機系統管理課程的內容通常包括以下方面：

- 計算機系統的組成和工作原理
- 操作系統的管理
- 網路的管理
- 安全的管理
- 備份和災難恢復
- 性能調優

計算機系統管理課程可以幫助學生了解計算機系統的管理和維護，為學生在計算機系統領域的職業生涯打下基礎。該課程還可以幫助學生提高計算機技能和解決問題能力。

總的來說，計算機系統管理是一門值得修的課程。該課程可以幫助學生了解計算機系統的管理和維護，提高計算機技能和解決問題能力。

以下是一些計算機系統管理課程的具體好處：

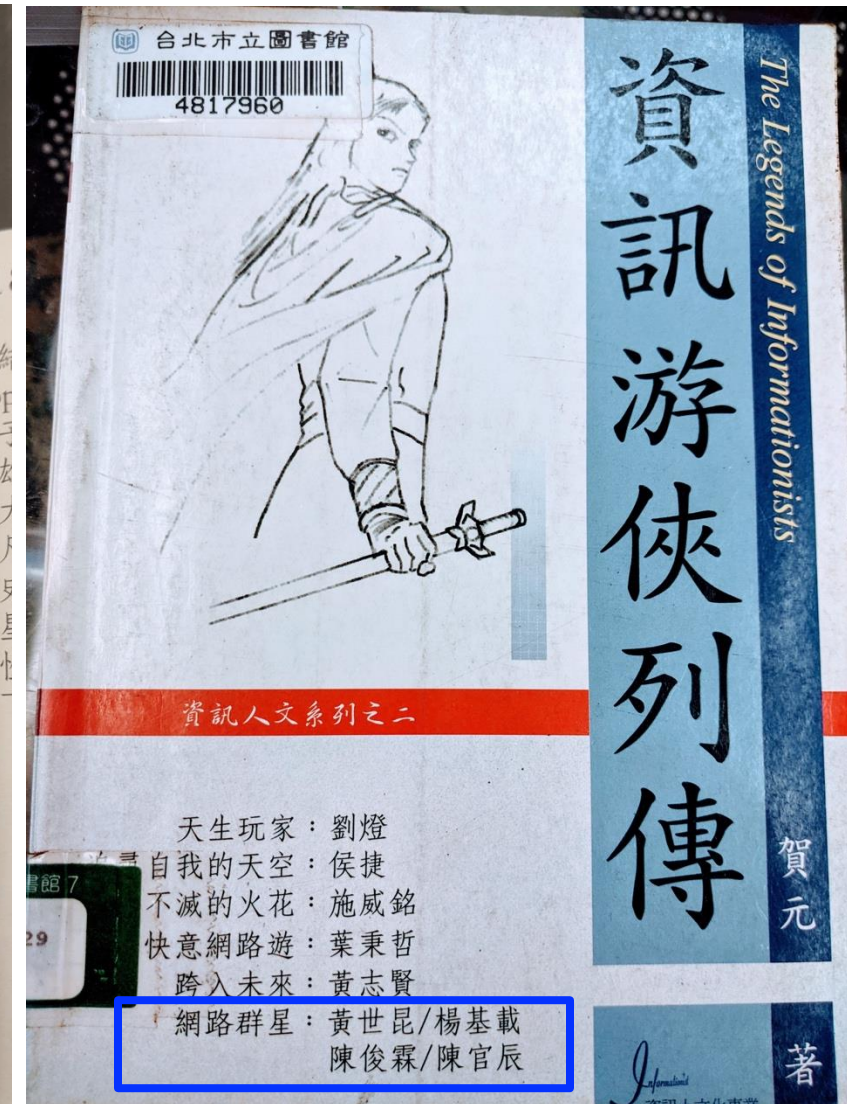
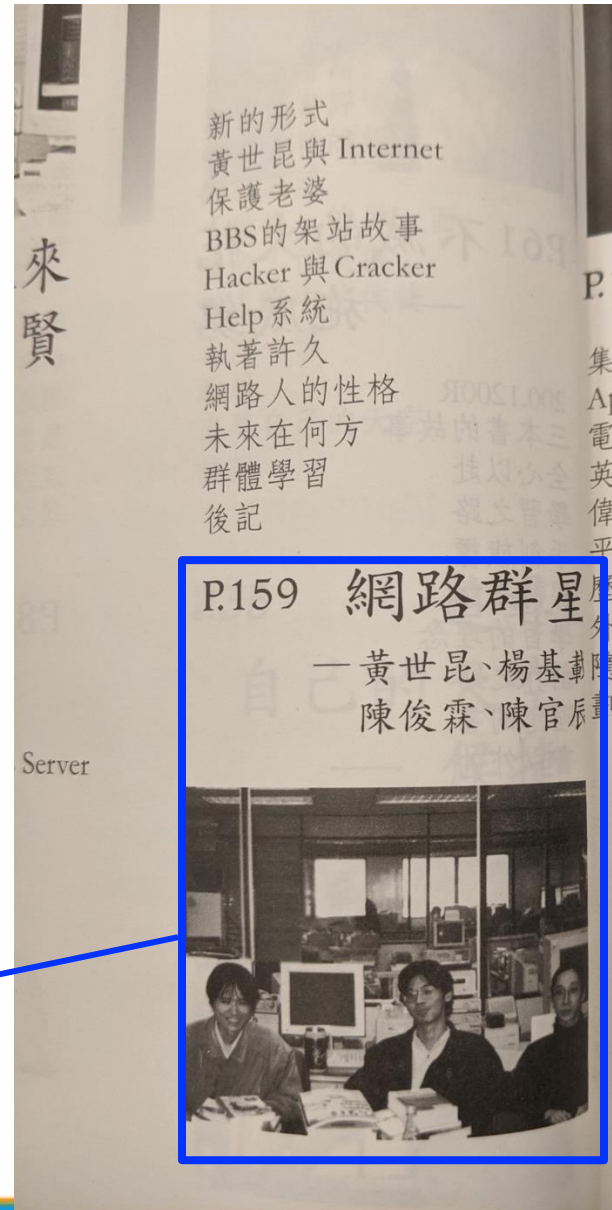
Why this course?

- NYCU CS has the only one “complete” departmental information technology center (called NYCU CSIT; a.k.a. computer center) in Taiwan.
- To cultivate professionals capable of operating CSIT, we offered two elective courses since 1996 (NCKU 2012-2022, NTU 2014-, NTHU 2019-) :
 - **Computer System Administration (Fall semester)** introduces basic **Unix** system administration skills, primarily in a **one-server scenario**.
 - **Computer Network Administration (Spring semester)** introduces advanced skills to operate the entire information technology center with **multiple servers and network equipment**.

NYCU CSIT - one of the main origins of Taiwan's Internet startups

- Wretch (無名小站)
- PIXNET (痞客邦)
- funP (雲沛創新集團)
- Appier (沛星互動科技)
- ...

Photo taken
at NYCU CSIT



$NASA = SA + NA$

NASA Course Website

Computer System and Network Administration, NYCU CSCC

[HOMEPAGE](#)[▼ COURSES](#)[▼ PROGRAMS](#)

Graduate Courses

System Administration Practice (SAP, 2015~2017)
Network Administration Practice (NAP, 2015~2018)

Undergraduate Courses

Computer System Administration (SA, 1996~)
Computer Network Administration (NA, 2009~)
(Computer) Network Management (NM, 1997~2008)

Useful Articles

提問的智慧 (zh-tw)
How To Ask Questions The Smart Way (en)



Three-year trial for graduates

NYCU CSIT is powered by Open Source

- Thanks to all the open-source contributors.
- This course is supported by MoE ITSA project.
- Let me know if you have open source contribution (bonus).



Press: [催生無名小站的資工領域人才搖籃](#)
[陽明交大借助ITSA將傳奇課程發揚光大](#)

What System Administrator Should do?

- Ordinary list
 - Installing new system, and updates of OS and software
 - Monitoring system and tuning performance
 - Adding and removing users
 - Adding and removing hardware
 - Backup and restore
 - Configuration management (Ansible, Chef, Puppet, SaltStack, ...)
 - Infrastructure management (Terraform, ...)

What System Administrator Should do?

- Ordinary list
 - Continuous Integration & Delivery (Jenkins, Travis CI, ...)
 - Log management (Fluentd, Papertrail, ...)
 - Security monitoring and reaction
 - Virtualization (VMWare, Xen, Bhyve, ...)
 - Containerization (Docker, ...)
 - Capacity planning
 - ...

What System Administrator Should do?

- Non-technique list
 - Helping users
 - Maintaining documentation
 - Moving furniture
 - Good communication and memorization
 - Leverage external memory
 - ~~Burning your liver~~

What System Administrator Should do?

- The best words to describe the job
 - Thankless job.
 - <https://sysadminday.com/>
 - System administration is like keeping the trains on time; no one notices it except when they're late.
 - When we do right, no one remembers; when we do wrong, no one forgets.

Two videos celebrating SysAdmin Day

- [Sysadrella \(2019\)](#)
- [This AI can do ANYTHING \(2022\)](#)

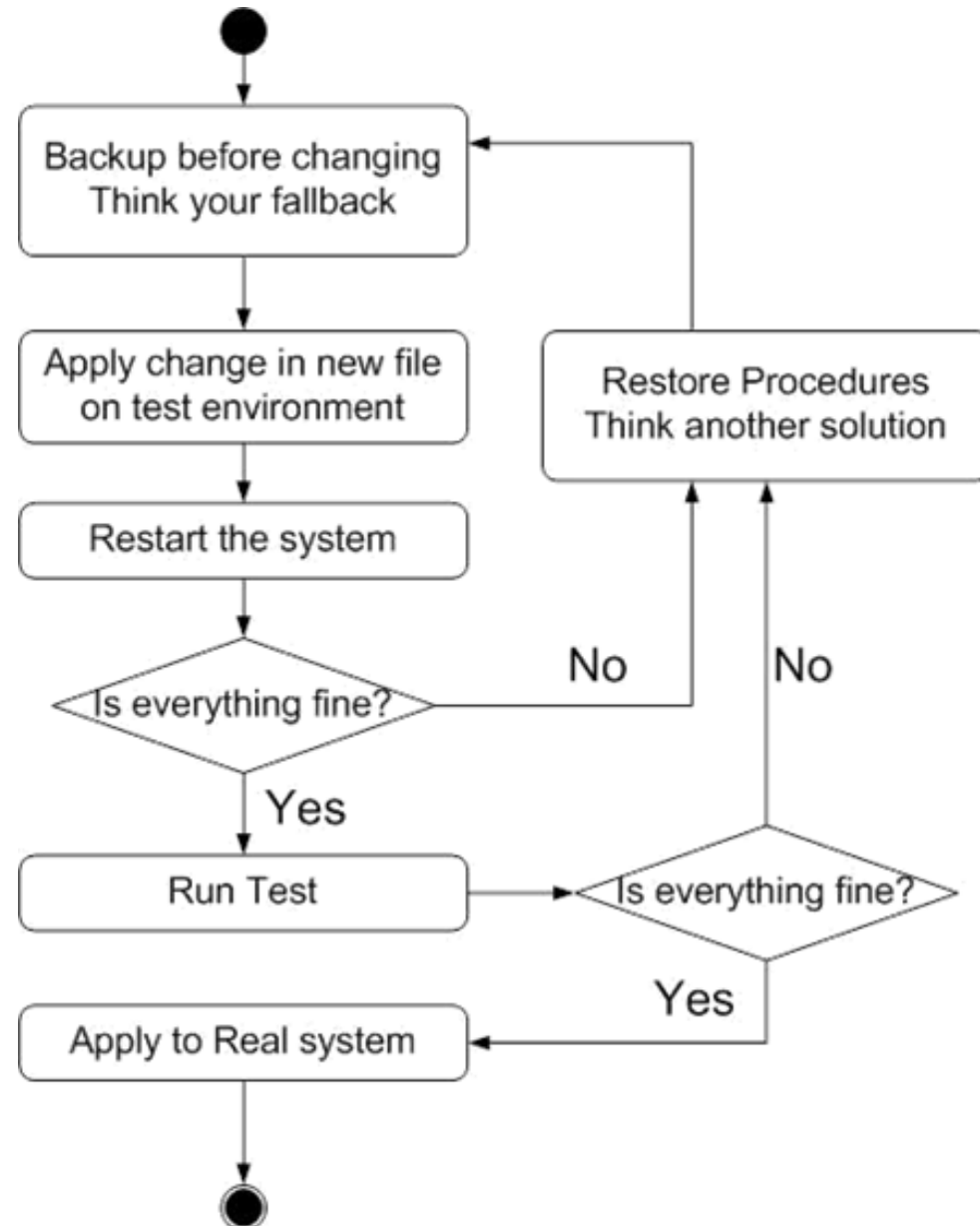


What System Administrator Must do?

- Philosophy of system administration
 - Know how things really work.
 - Plan it before you do it.
 - Make it revertible.
 - Make changes incrementally and backward-compatible.
 - Test thoroughly before unleash it.

What System Administrator Should do?

- Flow of Change



What System Administrator Should do?

- The skills to be a candidate of system administrator
 - We are not going to teach you cool & new things
 - But how to master these skills
 - Find and read authoritative docs, not just copy & paste from an arbitrary webpage on Internet or AI tools
- System Administration (in Fall semester)
 - Manage one server
- Network Administration (in Spring semester)
 - Manage a network consisting of multiple servers and devices

About the Operating System

- Most of the course materials will take Debian Linux as examples
 - Debian Linux 13 (Trixie) is recommended



Attitude

- Attend every class
- Do every exercise
 - As early as possible
 - **On your own**
- Read documents and practice at least 6 hours every week
 - Use unix-like environment
 - Recommend: more than 1.5 hours/day averagely.
- Collect information on the internet
 - The newer, the better.

Syllabus

- Instructor:
 - 蔡孟勳 (Meng-Hsun Tsai)
tsaimh@cs.nycu.edu.tw
Office: EC125C, Tel: ext. 56668
 - Office Hour: By appointment
- Class Time/Classroom:
 - M567 (Monday 13:20 ~ 16:20)
 - EC324 (synchronously EC315, EC316)

Syllabus

- Discussion Forum
 - <https://groups.google.com/forum/#!forum/nctunasa>
 - We suggest you to join - TAs might give homework hints there
 - Request join and tell us your student ID
 - Ask **course-related/technical questions** there
 - Everyone in the group can answer/vote
 - **But DON'T post answer/configuration there directly!**
 - You will be banned

Syllabus

- Lecture/Exam in Chinese
 - Not recommend for those who do not speak Chinese
- TAs:
 - We have seven TAs (phkoan, ymlai, bjhuang, ytshih, hsuchy, bogay, tyc).
 - Email to TAs: ta@nasa.cs.nycu.edu.tw
 - Also received by the instructor
 - Office hour
 - by appointment, @CSIT
 - Website:
 - <https://nasa.cs.nycu.edu.tw/sa/2025/>

Syllabus

- Email Policy (**IMPORTANT**)
 - Don't send course-related/technical questions to TAs
 - TAs won't answer you
 - Please ask them on course forum instead
 - Only ask TAs for personal/non-technical questions
 - Course registration/dropping
 - Grading
 - Office hour appointment
 - ~~Demo appointment~~

Syllabus – Grade Policy

- Midterm (Handwriting)
 - 15%
- Final (Computer-based)
 - 25%
- Homeworks
 - 60%
 - No Delay Submission
 - 3 homeworks

What you should prepare?

- Background knowledge
 - Basic knowledge of UNIX commands
 - Basic Programming skills
 - Basics of TCP/IP Networking
- Environment
 - Virtual Machine (Virtualbox, VMware)
 - Bare-metal Machine is also fine
- Yourself
 - Your hard study

Finally, Am I OK to take this course?

- Are you willing to devote yourself to exercise?
 - Yes! Please come
- Are you newbie in this area?
 - Yes!? It's ok, Please come
- Do you take more than 3 major courses?
 - Sometimes you may spend the whole weekend to just figure out what to do in the homework
 - Loading of this course **roughly equals to 2~3 major courses**
- **You will learn a lot if you study hard**

Some comments on the Internet

- 2010

雖然這門課的作業確實有點重，但也因為這些作業，使得 SA 比任何一門課都更能測試與磨練解決問題以及學習的能力。有心想修的同學可以透過課程網頁開始自行預習和做作業，相信一定會有不少收穫。

- 2018

這門課是一堂注重實務的課，只要肯認真寫作業、認真看 manual，一定可以給你滿滿的收穫。

- 2021

雖然早有耳聞SA 和NA是交大兩大硬課，可作業拿到手上還是被嚇到了，hw1就花了不少功夫在寫，hw2更是到了現在還有bug沒修好。整個壓力山大，加上必修課和專題，還有個最致命的GPE（對沒錯我超爛 大三還沒考過QQ）。最近期中考周整個人快要死掉，連室友都被我的氣色嚇到那種。



國立交通大學

昨天面試工作，被問有沒有修過 SA。

B3 · 2021年10月29日

Basic knowledge in this course

國立陽明交通大學資工系資訊中心

Information Technology Center, Department of Computer Science, NYCU

Play with Unix-Like system

- Our department has Linux workstations for all students
 - linux{1,2,3,4}.cs.nycu.edu.tw
 - alumni.cs.nycu.edu.tw
 - About CS workstation
 - <https://it.cs.nycu.edu.tw/workstation-guide>
- Get familiar with CLI (command line interface)
 - Without GUI (graphics user interface)
 - Don't be afraid

- SSH (Secure Shell)
 - Putty (Windows)
 - WSL (Windows)
 - Terminal (macOS)
 - GNOME Terminal

```
Last login: Sat Aug 30 08:41:08 2025 from 140.113.0.229
```

```
[Meng-Hsun Tsai@pts/5(linux1)][~] >
```

Commands

- Useful commands
 - `ls`
 - `passwd`
 - `mkdir`, `rmdir`
 - `cp`, `mv`, `rm`
 - `poweroff`, `shutdown -p now`
 - `reboot`, `shutdown -r now`
 - ...
- Most important command: `man`
- Basic command tutorials
 - <https://it.cs.nycu.edu.tw/unix-basic-commands>

Conventions in man pages

- Syntax of commands:
 - Anything between "[" and "]" is optional.
 - Anything followed by "..." can be repeated.
 - {a | b} – you should choose one of them.
 - bork [-x] { on | off } filename...

Yes/No	Commands
O	bork on /etc/hosts
O	bork -x off /etc/hosts /etc/passwd
X	bork -x /etc/hosts
X	bork -h /etc/hosts

Q & A

國立陽明交通大學資工系資訊中心

Information Technology Center, Department of Computer Science, NYCU