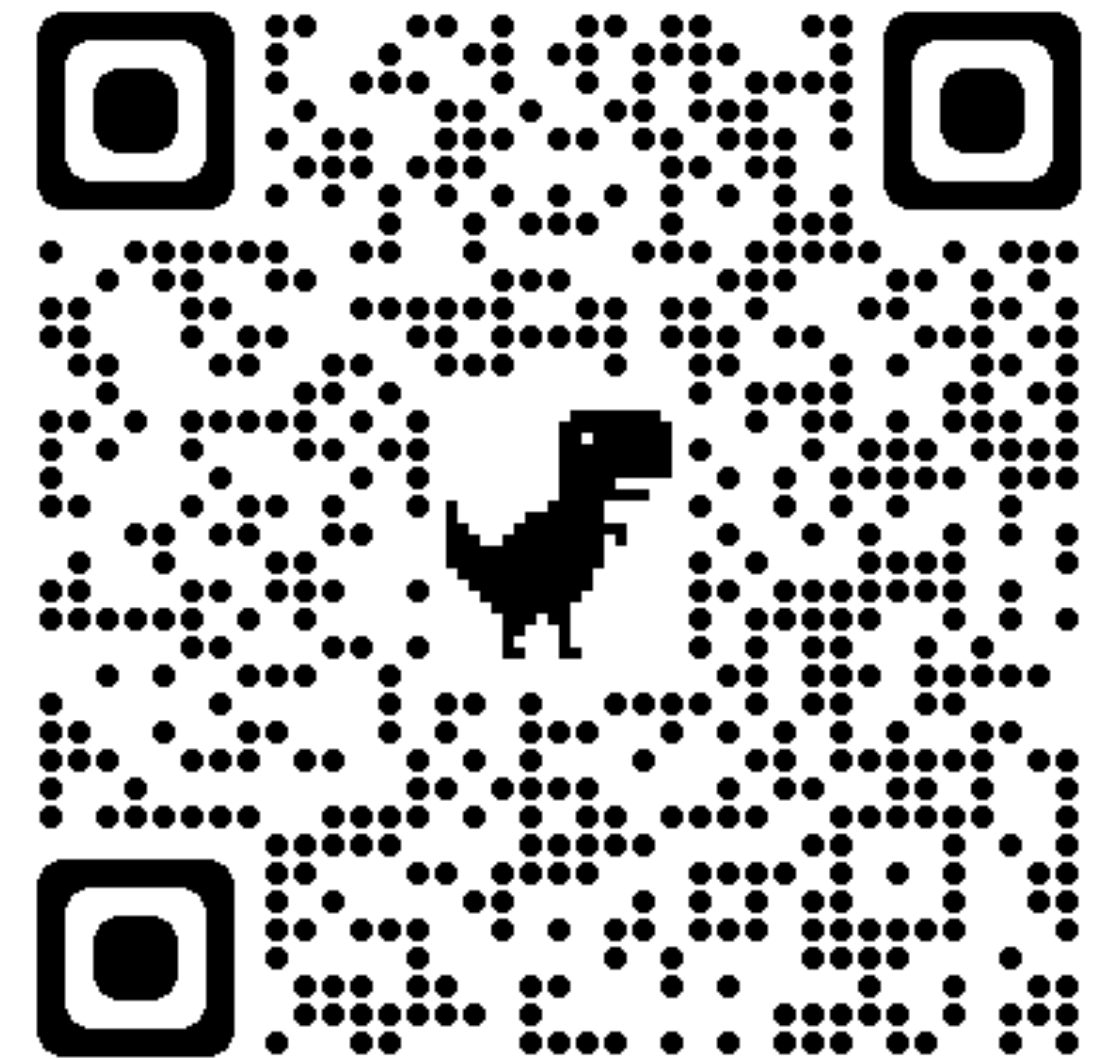# Computer networks (電腦網路)

Van-Linh Nguyen
(阮文齡)

Fall 2024

About me

- Van-Linh Nguyen (阮文齡)

- Cyber Information Security Laboratory (CIS Lab)

- A computer networks and Cybersecurity guy

- E-mail: nvlinh@ccu.edu.tw

My profile

Course information

Course name	Computer networks (電腦網路)
Teacher	Van-Linh Nguyen
Place & time	Inn 創新大樓326 , 13:15-16:00, Thursday
Online discussion	Ecourse2
Ask me	nvlinh@ccu.edu.tw
Online resource	https://sites.google.com/view/nvlinh/teaching/computer-networks
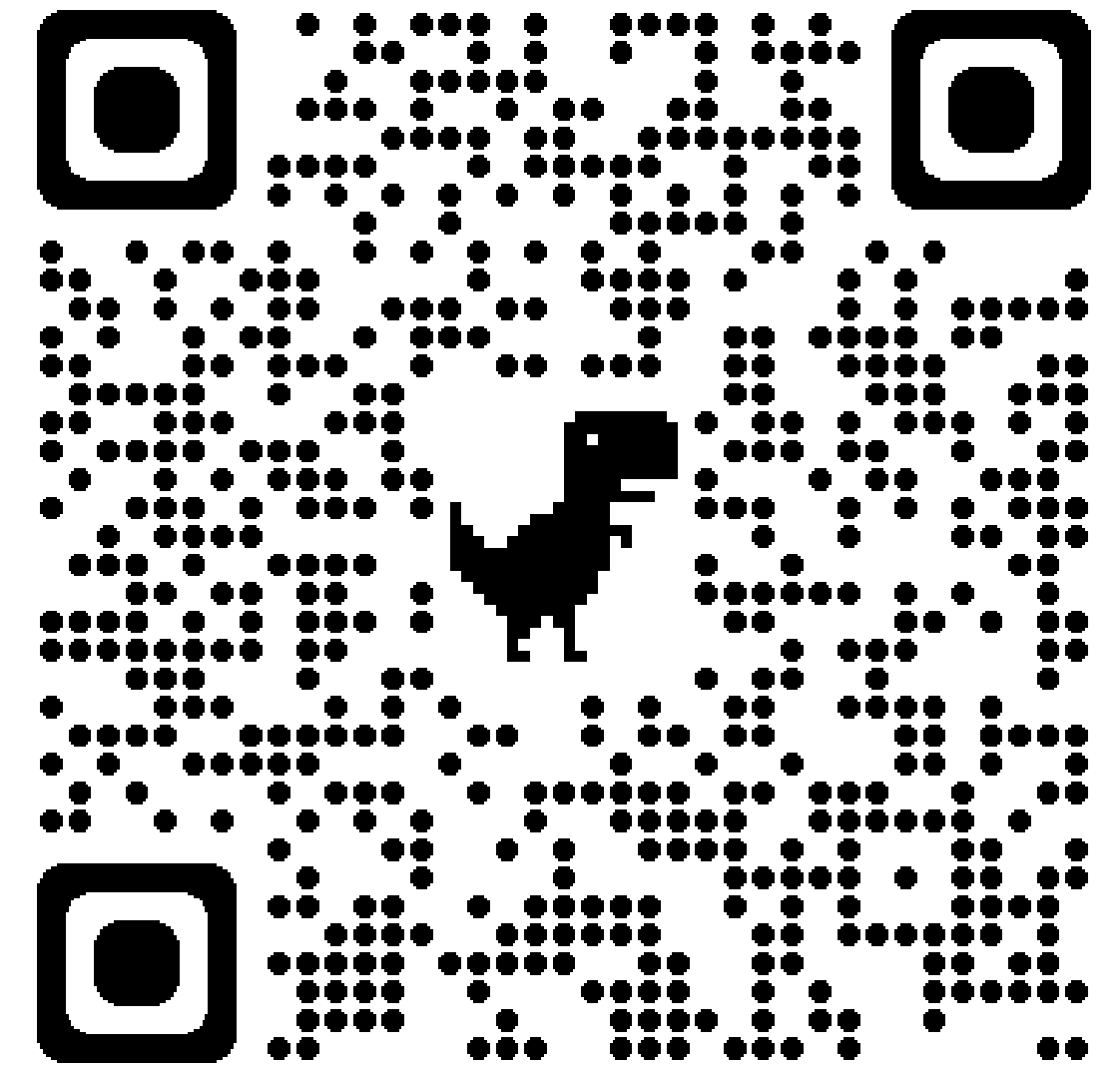
Link for course materials (slides)
(Available in Ecourse2 too)

Weekly schedule

💻 Means you should bring your laptop to test/simulate some real scenarios

Week	Date	Lesson		Homework
1	Sep 12	Course Introduction & Foundation		
2	Sep 19	Network applications		
3	Sep 26	End-to-End Data	💻 *Packet Tracer/GNS3*	
4	Oct 3	End-to-End Protocols	💻 *Packet Tracer/GNS3*	Hw1 out
5	Oct 10	Switching – Distance learning		
6	Oct 17	IP Routing	💻 *Packet Tracer/GNS3*	
7	Oct 24	Ethernet/LAN	💻 *Packet Tracer/GNS3*	Hw1 due
8	Oct 31	Wireless networks/WLAN	💻 *Packet Tracer/GNS3*	
9	Nov 7	Mid-term exam		
10	Nov 14	Resource allocation		
11	Nov 21	Congestion control	💻 *NS3/OMNET++*	
12	Nov 28	Network security		Hw2 out
13	Dec 5	Multicast + Mobile IP	💻 *NS3/OMNET++*	
14	Dec 12	Software-defined networks	💻 *Mininet/P4*	
15	Dec 19	Protocol-independent networking programming		Hw2 due
16	Dec 26	SD-WAN/Fabric, ONOS – Distance learning		
17	Jan 2	Demonstration/BONUS report		
18	Jan 9	Final exam		*Contest demo*

Packet Tracer/GNS3 can be downloaded at https://www.packettracernetwork.com/download/download-packet-tracer.html
NS3/OMNET++ can be downloaded at https://www.nsnam.org/ and https://omnetpp.org/download/
Mininet/ONOS can be downloaded at https://mininet.org/ and https://opennetworking.org/onos/
Parrot Security/Kali Linux can be downloaded at https://www.parrotsec.org/ and https://www.kali.org/

- Learn network applications and infrastructure operations
- Learn to configure wireless/LAN/WLAN networks
- Learn to setup private networks/maintain cloud systems
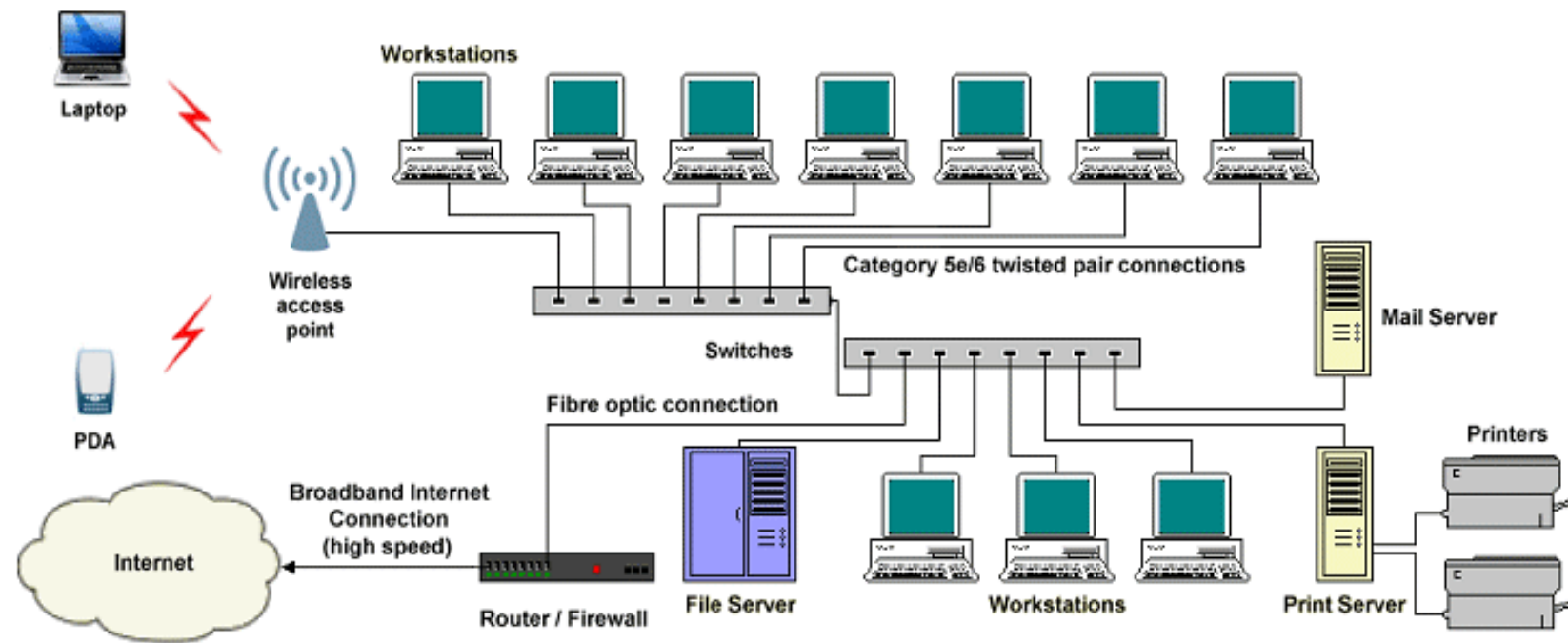
Src: TechnologyUK

Grade evaluation (評量方法)

0-10%   Attendance (上課點名)

20%   Homework (作業)

40%   Midterm exam(期中考)

30%   Final exam (期末考)

10%   CCNA, network contest participation (bonus)

Network Administrator

Src: Google/Cisco   Cloud System Administrator

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Cybersecurity Lab

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政治大學
中研院
中央大學
TAOYUAN
清華大學
TAIPEI
宜蘭大學
陽明交通大學
台北主節點
HSINCHU
新竹主節點
ILAN
MIAOLI
中興大學
暨南國際大學
TAICHUNG
東華大學
台中主節點
CHANGHUA
HUALIEN
中正大學
NANTOU
YUNLIN
CHIAYI
TAINAN
台南主節點
TAITUNG
KAOHSIUNG
成功大學
PINGTUNG
中山大學

主節點
CORE NODE
骨幹線路
CORE LINE
100Gbps
200Gbps

GigaPOP
GigaPOP 線路
50Gbps

學研網路TWAREN-國家高速網路與計算中心

Contest
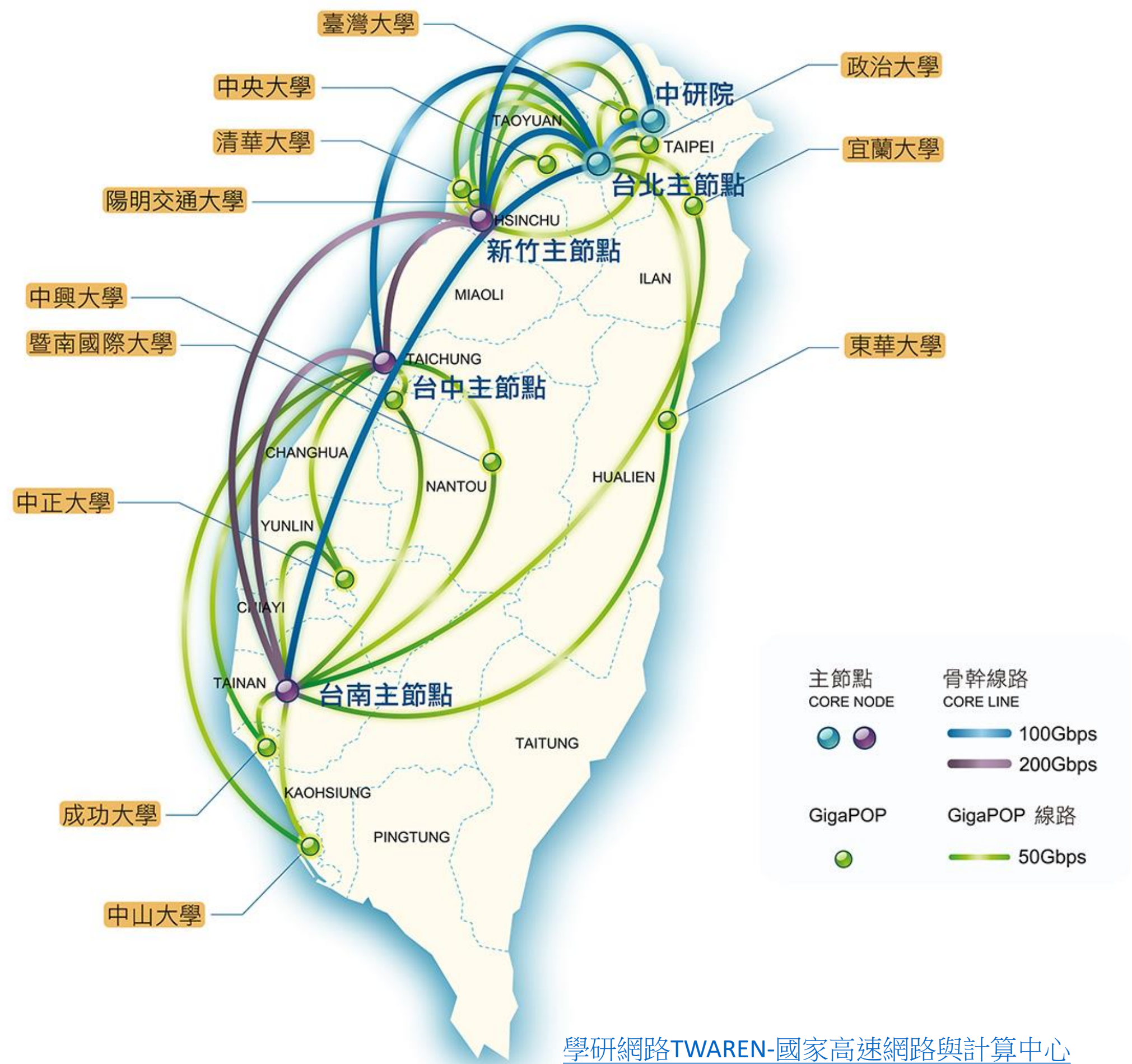
CCNA

- The basic certificate
for network administrator

A sample CCNA certificate

Network contest/conference participation

- Attend famous conference: ICC, GLOBECOM, INFOCOM, VTC,....

- Participate national contest about networking: TANet, TWAREN

- Bonus: 10%

- **Computer Networks: A Systems Approach**, 6th edition, Larry L. Peterson, Bruce S. Davie

- Hardcopy or PDF or online link

https://book.systemsapproach.org/

- Slides are available

https://www.dropbox.com/scl/fo/by7g7bbkybskvq566jlpn/h?rlkey=7mcoutfoj709mfhuy9oedfyqh&dl=0

1. There are **two** homework assignments

2. Topics can be:
   - ✓ Routing/Switching Configuration
   - ✓ Networking Problem Fixing
   - ✓ Congestion Problem Fixing
   - ✓ Software-defined networking Applications (SDN, ONOS)

3. Grading
   - ✓ The configuration scripts/settings work well with clear screenshots
   - ✓ Homework report the findings/solutions from the analysis in a comprehensive manner (clear description on the solution method, results, tips,…)

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1. Ten questions:120 points
   - ✓ 8 easy/moderate questions: 10 points per correct answer
   - ✓ 2 hard questions: 20 points per correct answer

2. Content source
   - ✓ Easy/moderate questions: lecture notes
   - ✓ Hard questions: homework, lecture notes, internet, …

If you fail to answer easy/moderate questions, you can answer hard questions to get high score!

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- ## Course issues (課程問題)
  - ✓ Ecourse2 Forum (e.g., questions)
  - ✓ Email TA/me

- ## Other issues (其他問題)
  - ✓ Email TA/me

  → When you email me, please type subject + content clearly (English or Chinese)
  要是你email給我的話,請清楚地輸入主題+內容(英文或中文都可以)
  → You can find my email on our department website
  你們可以在學系的網站上找到我的電子郵件

My email: nvlinh@cs.ccu.edu.tw

When you email me, you may like checking your spam box if no reply within 1-2 days.

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High recommendation

- Question and debate in the class

- Finish your homework

- Focus on programming/implementation/paper reading skills

This course may benefit your early career as much as you study it seriously, not only pass the exam!

Some software to download

- *Packet Tracer/GNS3 can be downloaded at   1.*

  1. *https://www.netacad.com/courses/packet-tracer*
  2. *https://www.packettracernetwork.com/download/download-packet-tracer.html*

- *NS3/OMNET++ can be downloaded at https://www.nsnam.org/ and https://omnetpp.org/download/*

- *Mininet/ONOS can be downloaded at https://mininet.org/ and https://opennetworking.org/onos/*

Packet tracer study

- Create a simple network

https://drive.google.com/file/d/1uiVXrviHup6ogMTxYIAZsbJqb4c-bcRf/view?usp=sharing

- Software download and simple guidelines

https://www.netacad.com/courses/packet-tracer

- CCNA course (very good resource):

https://wwW.youtube.com/watch?v=XgcGcrLKu1A&list=PLxbwE86jKRgMQ4HTuaJ7yQgA2BoNwY9ct

- Complicated projects

https://www.youtube.com/watch?v=_yqDRZgjP5k&list=PLyEymK89ZUabd7h9FK4dGVdONbxFEJoyk