

EE4204

Computer Networks

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EE4204 Lecture Notes

Computer Networks

EE4204 Administrative Details

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Assessment:	15% Lab 15% Quiz 1 15% Quiz 2 5% Lecture Activities & Homework 50% Final Exam
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EE4204 Syllabus – Part II

- Protocols & Layering
 - OSI Layers
 - Cross Layer Design
- Network Layer
 - Internet Protocol
 - Routing
 - Multicast
- Transport Layer
 - End-to-End
 - TCP
 - Flow & Congestion Control
- Hands-on
 - Packet analysis with Wireshark
 - TCP analysis
 - Setting up a wireless router

Course References

- J. Kurose & K. Ross, ``Computer Networking: A Top-Down Approach Featuring the Internet' ', Pearson/Addison-Wesley, 3rd edition, May 2004. 4th edition, July 2007.
- Peterson & Davie, “Computer Networks: A Systems Approach”, 2nd Edition, Morgan Kaufmann, 2000.
- William Stallings, “Data and Computer Communications”, 6th edition, Prentice Hall, 2000.
- S. Tanenbaum, “Computer Networks”, 3rd edition, 1996, 4th edition, 2003, Prentice Hall, PTR.
- Alberto Leon-Garcia & Indra Widjaja, “Communication Networks: Fundamental Concepts and Key Architectures”, 2nd edition, McGrawHill, 2004.
- Other links to references will be provided throughout the semester and updated on the course webpage.

Getting to know each other

- Why are you taking this class?
 - Please think about this and feed back to me.
- What do I expect?
 - Sincere effort – you must have a desire to learn.
 - Ask questions – you can interrupt me to ask a question!
 - Do the homework – this is where the heavy learning happens.
 - Self-learning – you must read and learn things on your own.
- How can you ask questions?
 - Old school: raise your hands 😊
 - New school: Send me an SMS!

Getting to know each other

- How will we run the class? (or Learning Methodologies)
 - Lectures – two way dialogue
 - Critical Thinking
 - Independent learning
- What will you get out of it? (or Learning Outcomes)
 - Understand Concepts of Computer Communication Networking
 - Learn how to think about problems
 - Learn how to learn
 - A good grade in this class 😊

Learning How to Learn

- Cultivate your curiosity - You should read extensively outside of class.
- Talk to Other Professors and Students
 - Find out what other researchers are working on to get a broad idea of the research space
- Good source of references include:
 - Textbooks
 - NUS: Physical Library & Digital Library
 - Magazine and Journal articles
 - IEEEExplore database
 - Learn to use Google!
- Great Web Site for Advice on Research:
<http://www.cs.cmu.edu/~mleone/how-to.html>

Topics in Computer Communication Networks

EE4204 topics

- Protocol Layering
 - OSI & Cross Layering
- Link Layer
 - Ethernet, Token Rings
 - Framing, Error detection
 - ARQ
 - Switching, virtual LAN
- Transport
 - TCP, Reliable transmission, flow/congestion control
- Network Layer
 - Routing & IP
- Packet analysis with Wireshark

Lots more to learn!

- Applications
 - Client/Server
- Socket programming
- DNS
- Advanced Routing
- Queuing Theory
- Medium Access Control (MAC)
- Physical Layer
- FEC, Compression
- Mobile & Wireless Networks
- Privacy & Security
- Quality of Service