Introduction to ITS 323 – Introduction to Data Communications

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Welcome

- To a first course on the basics of communications and how computer networks and the Internet work

- A 3rd year course for computer scientists and IT professionals

Who Am I?

- Steve Gordon

- Assistant Professor in ICT

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What will you learn in ITS 323?

- Components of computer networks

- Transmission techniques
  - How are bits transferred from source to destination over different mediums

- Communication protocols: principles and details
  - Protocol mechanisms: retransmissions; error detection; flow control; …
  - Details of common/important protocols: Ethernet, TCP, IP, …

- Internet architecture and applications
  - What is the Internet and how do applications work?

Topics

- Introduction to Data Communications
- Protocol Architectures
- Data Transmission
- Transmission Media
- Signal Encoding Techniques
- Digital Data Communications
- Data Link Control Protocols

- Circuit and Packet Switching
- Local Area Networks
- Routing in Switched Networks
- Internetwork Protocols
- Transport Protocols
- Internet Applications

Why is ITS 323 Useful?

- It will help you get a job!
  - ISPs (Pacific, True), Telecommunication companies (CAT, TOT, AIS), service companies (IBM, HP), equipment manufacturers (Toshiba, Cisco), small to large businesses (e.g. as network manager/engineer), …
  - Designing and writing Internet applications
  - Managing computer networks
  - Designing and managing telecommunication systems

- Prerequisite to other courses:
  - Computer Network Architectures and Protocols
  - IT Lab II (Networking)
  - Internet Technologies and Applications

- You will have an understanding of:
  - The principles of telecommunication systems
  - Details of popular Internet protocols and systems
  - Principles of building networks

Prerequisites

- There are no formal prerequisites, but I assume you know:
    - Basic engineering mathematics (waveforms, statistics, …)
    - Operating system concepts (processes, RPC, …)
    - Software design principles (divide-and-conquer, functions, …)
    - Programming languages (e.g. C, C++, Java or similar)

Course Structure

- Lectures
  - 3 hours per week

- Self study
  - At least 6 hours per week
  - Browsing lecture notes BEFORE and AFTER class, reading the textbook and other materials, studying for quizzes and exams, preparing assignments, consultations, group discussions, …

- Assessment

Assessment

- Quizzes
  - 10 minute quizzes at the beginning of selected lectures
  - Cover the topics since the last quiz
  - Test your understanding of lectures, reading materials and homework problems
  - Closed book
  - 6 quizzes; 5 best marks will count
  - 15% total (3% each)
- Assignments
  - Set of problems for you to complete over a number of weeks
  - Test your in-depth understanding of concepts and protocols
  - Open book
 - 20%

Assessment

- Mid-term Exam
  - Test your knowledge and understanding of all material to date
  - Closed book
  - 30%

- Final Exam
  - Test knowledge of topics after mid-term (and some before!)
  - Closed book
  - 35%

- For advice:
  - Closed book assessment is not a memory test (e.g. I won't test your ability to remember header formats) – it's a test of understanding
  - We will discuss types of questions and topics before exam

Academic Misconduct

- What is it?
  - Plagiarism, cheating, copying, "lending", …
- Examples
  - Copying assignment answers from friend (verbal or written)
  - Giving your assignment (or some answers) to a friend
  - Looking at neighbours answers during quiz/exam
  - Copying sentences/paragraphs/code from textbooks/Internet without acknowledgement
- Results
  - First time: receive 0 for the quiz (or assignment)
  - Second time: receive 0 for all quizzes (or assignments)
- Discussion with friends is encouraged; telling your friends answers is not!

Learning Materials

- Lectures
  - Attend, listen and ask questions!
  - Will include examples and demonstrations
- Lecture notes
  - PDF of Powerpoint slides
  - Available on website and from copy centre
  - Aim to have available 1 day before lecture
  - Make your own notes
- Recommended Textbook
  - "Data and Computer Communications" by Stallings
  - 8th Edition (90% of my content is based on this)
- Other Useful Textbooks
  - Earlier editions of Stallings textbook
  - These other textbooks should only be used as supplementary readings
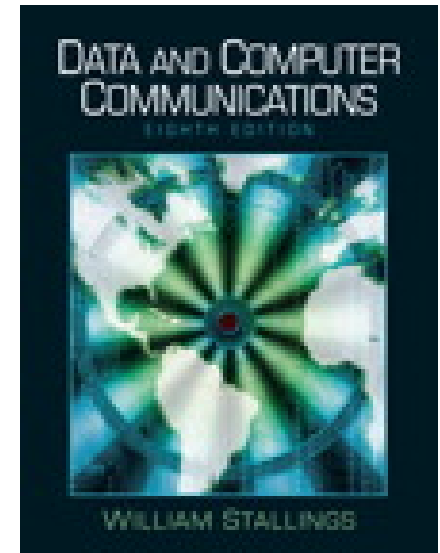
Learning Materials

- Recommended Readings
  - Almost every lecture corresponds to a chapter in the Stallings textbook; it is recommended you read the chapter before the lecture

- Homework Problems
  - Stallings textbook contains useful practice homework problems; try to solve them!

- Course Website
  - All materials will be available from the website
  - Announcements, selected solutions will be on the website

- Mailing list (access via course website)
  - You must subscribe (as will be used for announcements)

Course Web Site

- http://ict.siit.tu.ac.th/~steven/its323/
  - Introduction, Topics, Lecture Notes, Assessment Schedule, Textbooks, Web Links, Extra Handouts, Maillist, …

  - When you click on Lecture Notes (and other handouts) to download, you will be prompted for a username and password:
    - Username: its323
    - Password: ictnetworks