Syllabus

Course Name: Computer Networks (網路技術與應用)

Textbook: "Computer Networks", 5th Ed., by Andrew S. Tanenbaum, carried by 東華/新月圖書公 司 (international edition)

Instructor: 林 永 松 (Rm. #808 of the 2nd Management College Building, 33661191, yslin@im.ntu.edu.tw)

Class Meetings: from 2:20 PM to 5:20 PM every Thursday

Grading Policy:

- 1. homework: 30%
- 2. midterm exam: 40%
- 3. final project/presentation: 30%
- 4. extra credits

Office Hours: by appointment via phone/email or after class meetings

Course Objectives:

- 1. to introduce the importance of computer networks
- 2. to discuss hardware, software and architecture issues for computer networks
- 3. to discuss a number of essential layers that constitute a protocol stack
- 4. to discuss a number of applications over computer networks
- 5. to introduce methodology for computer network planning and management
- 6. to train executive professionals who need to know computer networks

Course Outline:

- 1. introduction
 - uses of computer networks
 - network hardware
 - network software
 - reference models
 - network standardization
- 2. the physical layer
 - the theoretic basis for data communication
 - transmission media
 - wireless transmission
 - the telephone system
- 3. the data link layer
 - data link layer design issues
 - error detection and correction
 - elementary data link protocols
 - sliding window protocols
 - protocol specification and verification
- 4. the medium access sublayer

- the channel allocation problem
- multiple access protocols
- IEEE standard 802 for LANs and MANs
- 5. the network layer
 - the network layer design issues
 - routing algorithms
 - congestion control algorithms
 - the network layer in the Internet
- 6. the transport layer
 - the transport service
 - elements of transport protocols
 - the Internet transport protocols (TCP and UDP)
- 7. the application layer
 - network security
 - multimedia
- 8. computer network planning and capacity management
 - network planning
 - network capacity management
- 9. special topics
 - planning and management of sensor networks
 - planning and management of wireless communications networks (e.g. GSM, GPRS, 3G and WLAN)
 - multicasting algorithms
 - content-based information retrieval/filtering
 - biometrics
- 10. lectures by distinguished speakers
- 11. other materials

Remarks:

- 1. A Web site (oplab.im.ntu.edu.tw) has been set up for students to upload project results and to download course handouts.
- 2. Proper materials shall be selected from the textbook to achieve the objectives of the course. Supplementary materials outside the textbook shall also be included in the course.

References:

- 1. Data Communications, Computer Networks and Open Systems, by Fred Halsall, carried by 新月圖書公司.
- 2. Computer Networking: A Top-Down Approach, by James F. Kurose and Keith W. Ross, Addison-Wesley, carried by 歐亞書局.