NJIT ECE-637
Internet and Higher Layer Protocols

Course Description	ECE 637, Internet and Higher Layer Protocols Introduce communication protocols used on the Internet. The outline includes a detailed study of the TCP/IP suite, covering protocols for the data-link to transport layers, Addressing, sub-netting, error control and flow control mechanisms used on intra- and inter-networking.
Pre-requisites	Graduate student or Instructor Permit
Learning Outcomes	Study Internet and high-layer protocols at graduate-level depth, introduction to network design, introduction to some useful networking tools
Section	102
Time	6:00-9:05 P.M.
Day(s)	Thursday

Instructor	Dr. Pitipatana Sakarindr
E-mail	ps6@njit.edu
Office Hours	Thursday 5:00-5:45 P.M. (or by appointment)
Office Room	ECEC 324

Required Textbooks:

TITLE: TCP/IP Protocol Suite
AUTHOR: Behrouz Forouzan
EDITION: 4th (2010)
PUBLISHER: McGraw-Hill
ISBN: 9780073376042

TITLE: Computer Networking: Performance and Quality of Service
AUTHOR: Ivan Marsic
EDITION: December 2010
WEB: http://www.ece.rutgers.edu/~marsic/books/CN/book-CN_marsic.pdf

Recommended (Optional) Textbooks:

TITLE: TCP/IP Illustrated, Vol. 1: The Protocols
AUTHOR: Richard Stevens
EDITION: 1994
PUBLISHER: Addison-Wesley Professional
ISBN: 978-0201633467

TITLE: Computer Networking: A Top-Down Approach

AUTHOR: James F. Kurose and Keith W. Ross
EDITION: 2009
PUBLISHER: Addison-Wesley Professional
ISBN: 978-0136079675

Grading Policy:
Quizzes: 25 (5 quizzes)
Mid-term exam: 20
Term Project: 20
Final exam: 35
Total: 100

Grading Policy:

Points	**Grade**
90 and Above	A
80-89	B+
70-79	B
60-69	C+
50-59	C
Below 50	F

Notes:
All points above .50 are rounded up (i.e., 69.50 is rounded up to 70.00, graded B)
All points below or equal .49 are rounded down (i.e., 69.49 is rounded down to 69.00, graded C+)

Weekly schedule of topics:

Session 1 Introduction and the physical layer protocols

a. Historical context of the Internet
b. Overview of the basic architecture of the original Internet and of today's Internet
c. Overview of OSI, TCP/IP protocol stack, and Internet Standards
d. The basic physical layer protocols (underlying technologies)

Sessions 2 and 3: The lower-layer protocols

a. The data link layer, including media access control (MAC)
b. Frame Relay
c. Ethernet: evolution and engineering considerations
c. Wireless LANs (IEEE 802.11x standards and products)

Sessions 4, 5, 6, 7 and 9: The networking layer protocols

a. Layer 2 (MAC) addresses vs. Layer 3 (IP) addresses
- Ethernet/MAC addressing
- The Address Resolution Protocol (ARP)

b. Internet Control Message Protocols (ICMP)
- ICMP Version 4
- ICMP Version 6

c. IP protocols
- IP Version 4
- IP Version 6

d. Unicast routing protocols (OSPFv.2, RIPv.1, RIPv.2)

Session 8 (Midterm exam)

Sessions 10, 11, 12 and 13: The transport layer

a. Transmission Control Protocol (TCP)
- Flow control
- Congestion control
- Error control

b. UDP

Session 14: Domain Name System (DNS), Dynamic Host Configuration Protocol (DHCP) and Widely used applications

a. The evolution of the domain name system
b. Technical and system architecture of the domain name system
c. Management of domain names and addresses
d. DHCP
e. E-mail
f. World Wide Web

Session 15: Final Exam

Attendance:

Class attendance for the full 3-hours session is MANDATORY. If you need to skip the session, please let me know in advance.

Quizzes:

Quizzes will be given with or without advance notices. *All quizzes are "**close book and notes**", unless stated otherwise*. Every quiz will start before or after the break (approx. 7:30-7:45pm). You will NOT be allowed to take a quiz if you come to the class at the late hour just to take the quiz.

Term project:

The details of the term project will be announced in the class.

Mid-term and Final exams:
The mid-term and final examinations will be "***open book and notes***" 90-minute exams. No electronic devices (except non-programmable calculators) are allowed during the exam.

How to keep up with the class:
1. Any announcements, course materials, quizzes and answers will be posted on the MOODLE (http://moodle.njit.edu)
2. If you have questions during the class, please raise your hands immediately. In addition, you can meet me at my office during office hours. A meeting outside the office hours must be scheduled via ps6@njit.edu.

Note: The instructor reserves the right to change this course syllabus at any time and any updates will be announced in the class.

NJIT's policies regarding Academic Integrity will be strictly enforced. The NJIT Honor Code will be upheld, and any violations will be brought to the immediate attention of the Dean of Students. The details of NJIT's academic integrity can be found at the following website http://integrity.njit.edu/index.html.